

Amendment to Data Evaluation Record on the Acute Toxicity of TEP containing Aminopyralid and 2,4-D DMA to Terrestrial Vascular Plants: Vegetative Vigor

EPA MRID Number 49368801

Data Requirement: EPA MRID 49368801
EPA Guideline Vegetative Vigor (850.4150)

Test material: GF-2633

-Aminopyralid, 4.3% (w) a.i. (97 g/L aminopyralid triisopropanolammonium; 51 g/L aminopyralid a.i.)
-2,4-D DMA, 36.1% (w) a.i. (509 g/L 2,4-D dimethylammonium; 423 g/L 2,4-D a.i.)

Primary Reviewer: Freeborn G. Jewett
Biologist, EPA/OPP/EFED/ERB1

Signature:  **FREEBORN JEWETT**

Date:

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DN: c=US, ou=U.S. Government,
ou=USEPA, ou=Staff, cn=FREEBORN
JEWETT, dnQualifier=0000069650
Date: 2015.11.18 11:35:42 -0500

Secondary Reviewer: Greg Orrick
Environmental Scientist, EPA/OPP/EFED/ERB1

Signature:  **2015.11.18 11:16:05**

Date: **-05'00'**

EPA PC Code: 005100 (Aminopyralid); 030019 (2,4-D dimethylammonium)
DP Barcode: D420138

Date Evaluation Completed: 11/18/2015

CITATION: Bergfield, A. GF-2633 (Aminopyralid, 50 g a.i./L:2,4-D, 400 g a.i./L SL): Effects on the Vegetative Vigor of Non-Target Terrestrial Plants (Tier II). Unpublished study performed by ABC Laboratories, Inc., Columbia, Missouri. Laboratory Project Number: 80610. Study sponsored by Dow AgroSciences, LLC, Indianapolis, Indiana. Study completed April 15, 2014.

REASON FOR REVISION: The original review of this study did not present toxicity endpoints for 2,4-D dimethylammonium. This amendment updates the endpoints so that they are presented in terms of both % aminopyralid and % 2,4-D dimethylammonium.

Maximum Labeled Rate: Not reported.

Most sensitive monocot: Onion, based on fresh weight.

Aminopyralid

IC₅₀: 0.0588 lb a.i./A 95% C.I.: 0.0515- 0.0671 lb a.i./A

IC₂₅: 0.037 lb a.i./A 95% C.I.: 0.0288- 0.0451 lb a.i./A

NOAEC: 0.0273 lb a.i./A

Slope: N/A 95% C.I.: N/A

2,4-D dimethylammonium

IC₅₀: 0.4936 lb a.i./A 95% C.I.: 0.4323- 0.5633 lb a.i./A

IC₂₅: 0.3106 lb a.i./A 95% C.I.: 0.2418- 0.3786 lb a.i./A

NOAEC: 0.2292 lb a.i./A

Slope: N/A 95% C.I.: N/A

Most sensitive dicot: Soybean, based on height.

Aminopyralid

IC₅₀: 0.00218 lb a.i./A 95% C.I.: 0.0017-0.00279 lb a.i./A

IC₂₅: 0.000464 lb a.i./A 95% C.I.: 0.000309-0.000669 lb a.i./A

NOAEC: 0.000427 lb a.i./A

Slope: N/A 95% C.I.: N/A

2,4-D dimethylammonium

IC₅₀: 0.01830 lb a.i./A 95% C.I.: 0.01427-0.02343 lb a.i./A

IC₂₅: 0.003895 lb a.i./A 95% C.I.: 0.002594-0.005616 lb a.i./A

NOAEC: 0.003585 lb a.i./A

Slope: N/A 95% C.I.: N/A

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

EPA MRID Number 493688-01

Data Requirement: EPA DP Barcode: D420138
EPA Guideline: 850.4150
MRID: 49368801

This DER was amended on
11/18/15

Test material: GF-2633

-Aminopyralid, 4.3% (w) ae (97 g/L aminopyralid triisopropanolammonium; 51 g/L aminopyralid a.e.)
-2,4-D, 36.1% (w) ae (509 g/L 2,4-D dimethylammonium; 423 g/L 2,4-D a.e.)

Primary Reviewer: Joan Gaidos
Senior Scientist, CDM Smith

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Secondary Reviewer: Teri S. Myers
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Date: 7/11/14

Primary Reviewer: Elyssa Arnold
OPP/EFED/ERB4

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Date: 2014.10.23
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EPA PC Code 005100

2,4-D DMA PC Code 030019



Date Evaluation Completed: 10/22/14

CITATION: Bergfield, A. GF-2633 (Aminopyralid, 50 g a.e./L:2,4-D, 400 g a.e./L SL): Effects on the Vegetative Vigor of Non-Target Terrestrial Plants (Tier II). Unpublished study performed by ABC Laboratories, Inc., Columbia, Missouri. Laboratory Project Number: 80610. Study sponsored by Dow AgroSciences, LLC, Indianapolis, Indiana. Study completed April 15, 2014.

EXECUTIVE SUMMARY:

The effect of formulated aminopyralid (GF-2633 SL; 4.3% aminopyralid a.e. and 36.1% 2,4-D a.e.) on the vegetative vigor of monocotyledonous (corn, *Zea mays*; onion, *Allium cepa*; and ryegrass, *Lolium perenne*) and dicotyledonous (carrot, *Daucus carota*; cucumber, *Cucumis sativus*; lettuce, *Lactuca sativa*; radish, *Raphanus sativa*; soybean, *Glycine max*; sugarbeet, *Beta vulgaris*, and turnip, *Brassica rapa*) terrestrial plants was studied at a nominal application rates of 0 (negative control), 0.293, 0.586, 1.17, 2.34, 4.69, 9.38, 18.8, 37.5, 75, 150, 300, 600, 1200, and 2400 mL product/ha for lettuce, radish, and turnip. Carrot, cucumber, soybean, sugarbeet and onion were tested with concentrations 2:1.17 and corn and ryegrass were tested with concentration 2:75 mL product/ha. The negative control was deionized water; no formulation control was included in the study.

Treatment rates were analytically confirmed for only the top three application rates and overall pre- and post-application recoveries ranged from 97 to 107% of nominal concentrations. Measured concentrations were not provided for the other 11 test concentrations. Toxicity values are therefore expressed by the reviewer in terms of nominal aminopyralid a.e. concentrations, calculated based on a concentration of 51 g a.e. aminopyralid/L (certificate of analysis, Appendix A of the study report). Application rates for aminopyralid were 0 (negative control), 0.0000133, 0.0000267, 0.0000532, 0.000106, 0.000213, 0.000427, 0.000855, 0.00171, 0.00341, 0.00683, 0.0137, 0.0273, 0.0546, and 0.109 lbs a.e./A. The equivalent application rates for 2,4-D (423 g a.e. 2,4-D/L) were 0 (negative control), 0.000111, 0.000221, 0.000442, 0.000883, 0.00177, 0.00354, 0.00709, 0.0142, 0.0283, 0.0566, 0.113, 0.226, 0.453, and 0.906 lbs a.e./A.

The growth medium used in the study was a natural soil mixed with sand (sandy loam, pH 5.9, organic carbon 1.5%). On Day 21 the surviving plants per pot were recorded, and plant height and total fresh weight were measured.

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Negative control survival was 100%. There were inhibitions in survival for carrot, corn, cucumber, lettuce, radish, sugarbeet, soybean, and turnip with maximums of 87, 10, 97, 13, 43, 33, 100, and 97%, respectively (Jonckheere-Terpstra test, $p < 0.05$). There were no significant effects on survival for onion or ryegrass.

There were significant inhibitions in weight for all species tested except ryegrass. There were significant weight inhibitions in carrot, lettuce, soybean, sugarbeet and turnip beginning at 0.00171 lb a.e./A with maximums of 99, 98, 92, 97 and 98%, respectively (Jonckheere-Terpstra test, $p < 0.05$; Williams test for soybean, $p < 0.05$). There were weight inhibitions for radish beginning at 0.00341 lb a.e./A with a maximum of 95%, for cucumber beginning at 0.00683 lb a.e./A with a maximum of 97%, and for corn and onion beginning at 0.0546 lb a.e./A with a maximum of 33 and 84%, respectively (Jonckheere-Terpstra test, $p < 0.05$).

There were significant inhibitions in height for all species tested except ryegrass. There were significant height inhibitions in soybean and turnip beginning at 0.000855 lb a.e./A with maximums of 77 and 54%, respectively; for cucumber and radish beginning at 0.00171 lb a.e./A with maximums of 93 and 58%, respectively; for carrot and lettuce beginning at 0.00341 lb a.e./A with maximums of 79 and 60%, respectively; for sugarbeet beginning at 0.00683 lb a.e./A with a maximum of 41% (Jonckheere-Terpstra test, $p < 0.05$; Mann-Whitney U test for soybean, $p < 0.05$; Dunnett test for lettuce and sugarbeet, $p < 0.05$). There was also significant height inhibition for onion beginning at 0.0546 lb a.e./A with a maximum of 37% (Jonckheere-Terpstra test, $p < 0.05$); and 14% inhibition for corn at 0.109 lb a.e./A (Williams test, $p < 0.05$).

The most sensitive monocot was onion based on fresh weight; NOAEC and IC_{25} values were 0.0273 and 0.037 lb a.e./A, respectively. The most sensitive dicot was soybean based on height; NOAEC and IC_{25} values were 0.000427 and 0.000464 lb a.e./A, respectively. In general, dicotyledonous plants were more sensitive than monocotyledonous plants to the test compound.

There were no significant phytotoxic effects in the control, based on visual injury. After 21 days, there were significant ($p < 0.05$) treatment-related phytotoxicity effects in all species with the exception of the monocot ryegrass.

Maximum Labeled Rate: Not reported.

Most sensitive monocot: Onion, based on fresh weight.

IC_{50} : 0.0588 lb a.e./A	95% C.I.: 0.0515- 0.0671 lb a.e./A
IC_{25} : 0.037 lb a.e./A	95% C.I.: 0.0288- 0.0451 lb a.e./A
NOAEC: 0.0273 lb a.e./A	
Slope: N/A	95% C.I.: N/A

Most sensitive dicot: Soybean, based on height.

IC_{50} : 0.00218 lb a.e./A	95% C.I.: 0.0017-0.00279 lb a.e./A
IC_{25} : 0.000464 lb a.e./A	95% C.I.: 0.000309-0.000669 lb a.e./A
NOAEC: 0.000427 lb a.e./A	
Slope: N/A	95% C.I.: N/A

This toxicity study is classified as **Supplemental**. The study is scientifically sound and can be used quantitatively in risk assessment. However, the study authors measured fresh weight instead of dry weight of plants, which is not consistent with the guideline recommendations for a vegetative vigor study. Additionally, study authors did not provide measured concentrations of test substance for all application rates and did not include a formulation control in the study.

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Table 1. Summary of most sensitive parameters by species (lb a.e. aminopyralid/A).

Species	Endpoint	NOEC	IC ₀₅	IC ₂₅	IC ₅₀
Carrot	Fresh weight	0.000855	0.000659	0.00175	0.00345
Corn	Fresh weight	0.0273	0.0252	0.0804	0.18
Cucumber	Height	0.000855	0.000237	0.00117	0.00355
Lettuce	Fresh weight	0.000855	0.000351	0.00105	0.00224
Onion	Fresh weight	0.0273	0.019	0.037	0.0588
Radish	Height	0.000855	0.000153	0.0038	0.0354
Ryegrass	None	0.109	NC ^a	>0.109	>0.109
Soybean	Height	0.000427	0.000502	0.000464	0.00218
Sugarbeet	Fresh weight	0.000855	0.000512	0.00168	0.00385
Turnip	Height	0.000427	0.0000497	0.00219	0.0303

^a NC- Not calculable. There was 5% inhibition of ryegrass fresh weight at the highest treatment level, compared to the negative control; the IC₀₅ value was not calculable using the nonlinear regression model.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The methods used in conducting this study were based on procedures specified in the U.S. EPA Series 850 – Ecological Effects Test Guidelines OCSPP Number 850.4150. Deviations from OCSPP 850.4150 were noted.

1. The physico-chemical properties of the test material were not reported in the study.
2. Fresh shoot weight was measured as opposed to dry weight, as recommended by OCSPP 850.4150 guidelines (January 2012). Variability in water content of the plants may have contributed to the variation observed for this endpoint.
3. Measured concentrations of test substance were provided for only 3 of 14 application rates.
4. No formulation control was included in the study

The guideline deviations do impact the acceptability of this study.

COMPLIANCE: Signed and dated GLP, Quality Assurance and No Data Confidentiality statements were provided. This study was conducted in compliance with USEPA FIFRA Good Laboratory Practice Standards (40 CFR Part 160) with the following exception: The latest well-water characterization performed in February 2012 was not performed in Accordance to the stated Good Laboratory Practices.

A. MATERIALS:

1. Test Material GF-2633 SL (8.3% Aminopyralid triisopropanolamine salt, 4.3% a.e.; 43.5% 2,4-D dimethylammonium, 36.1% a.e.)

Description: Yellow liquid; density 1.1705 g/mL

Lot No./Batch No.: 2E08161104

Purity: 99.0% (8.3% aminopyralid, w/w; 36.1% 2,4-D)

Stability of compound

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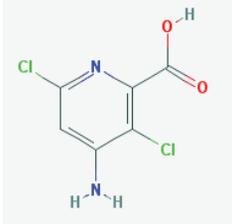
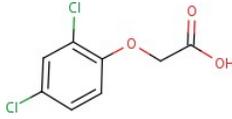
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under test conditions: Analytical recoveries of the test material in water at the three highest application rates ranged from 98 to 107% (n = 6); pre- and post-application recoveries from the stock spray solution at the three highest application rates yielded recoveries of 97-107% (n = 12). Recoveries of high and low spikes (0.13 and 0.65 mg a.e./L) yielded recoveries of 100-108% of nominal (n = 6).

(OECD recommends chemical stability in water and light)

Storage conditions of test chemicals: The test material was stored at room temperature.

Physicochemical properties of aminopyralid.

Parameter	Aminopyralid		2,4-D	
	Values	Source	Values	Source
Water solubility	205 g/L at 20°C	D415743 ¹	569 mg/L at 20°C	USEPA, 2005 ²
Vapor pressure at 20°C	7.14×10 ⁻¹¹ torr at 20°C	D415743 ¹	1.4 x 10 ⁻⁷ torr at 25°C	USEPA, 2005 ²
Structure				
pK _a at 20°C	2.56 at 20°C	D415743 ¹	2.60 at 25°C	MRID 47112202
Log K _{ow} at 19°C; pH 7	-2.87	D415743 ¹	0.18	USEPA, 2005 ²

¹ Registration Review: Preliminary Problem Formulation for Environmental Fate, Ecological Risk, Endangered Species, and Human Health Drinking Water Exposure Assessments for Aminopyralid, Potassium Salt of Aminopyralid, and Triisopropanolamine Salt of Aminopyralid. Environmental Fate and Effects Division, Office of Pesticide Programs. DP Barcode 415743. Dated February 12, 2014.

² Reregistration Eligibility Decision for 2,4-D. Office of Prevention, Pesticides and Toxic Substances. (7508C) EPA 738-R-05-002 June 2005. http://www.epa.gov/oppsrrd1/REDs/24d_red.pdf

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Gramineae; H8920), Onion (*Allium cepa*, Liliaceae; Yellow Granex Hybrid), and Ryegrass (*Lolium perenne*, Gramineae; Peak).

Dicotyledonous species: Carrot (*Daucus carota*, Umbelliferae/ Danvers 123 Organic); Cucumber (*Cucumis sativus*, Cucurbitaceae; Straight Eight); Lettuce (*Lactuca sativa*, Compositae; Grand Rapids); Radish (*Raphanus sativa*, Brassicaceae; Crimson Giant); Soybean (*Glycine max*, Leguminosae; Williams 82); Sugarbeet (*Beta vulgaris*, Chenopodiaceae, Beta 4521R) and Turnip (*Brassica rapa*, Cruciferae; Purple Top).

Seed source: Carrot, cucumber and turnip obtained from NE seed; Corn obtained from Syngenta Seed Care; Lettuce and Radish obtained from Sustainable Seed Company; Onion obtained from Park Seed Co.;

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Ryegrass obtained from Hummert International; Soybean obtained from Missouri Foundation Seeds; and Sugar Beet obtained from Betaseed, Inc.

Prior seed treatment/sterilization: The seeds were not treated with any type of fungicides, insecticides, or any pesticides.

Historical % germination of seed: Carrot, 80%, corn, 99%; cucumber, 90%; lettuce, 98%; onion, 96%; radish, 99%; ryegrass, 94%; soybean, 97%, sugarbeet, 94.8%, and turnip, 90%.

Seed storage, if any: Not reported.

B. STUDY DESIGN:

1. Experimental Conditions

- a. Limit test: None
- b. Range-finding study: None
- c. Definitive Study

Table 3: Experimental Parameters – Vegetative Vigor.

Parameters	Vegetative Vigor	
	Details	Remarks
		----- <i>Criteria</i>
Duration of the test	21 days	<p>-----</p> <p><i>Recommended test duration is 14-21 days.</i></p> <p><i>OECD recommends that the test be terminated no sooner than 14 days after 50 percent of the control seedlings have emerged</i></p>
Number of seeds/plants/species/replicate	Six replicates with one pot each and each pot with 5 plants; with the exception of cucumber, which had 3 plants per pot and 2 pots in each of six replicates	<p>-----</p> <p><i>Five plants per replicate are recommended.</i></p>
Number of plants retained after thinning	Application at 2-4 leaf stage	
<u>Number of replicates</u> Control: Adjuvant control: Treated:	6 N/A 6	<p>-----</p> <p><i>Four replicates per dose should be used.</i></p> <p><i>OECD recommends a minimum of four replicates per treatment</i></p>

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
<p><u>Test concentrations (lb ai/A)</u></p> <p>Nominal:</p> <p>Measured:</p>	<p><u>Nominal rates in mL product/ha:</u> 0 (negative control), 0.293, 0.586, 1.17, 2.34, 4.69, 9.38, 18.8, 37.5, 75, 150, 300, 600, 1200, and 2400 mL product/ha</p> <p><u>Nominal rates in lbs a.e. aminopyralid/A:</u> 0 (negative control), 0.0000133, 0.0000267, 0.0000532, 0.000106, 0.000213, 0.000427, 0.000855, 0.00171, 0.00341, 0.00683, 0.0137, 0.0273, 0.0546, and 0.109 lbs a.e./A.</p> <p>Not reported. 97-107% of nominal for top 3 concentrations.</p>	<p>Lettuce, radish, and turnip tested at all concentrations.</p> <p>Carrot, cucumber, soybean, sugarbeet, and onion tested at concentrations 2:0.0000532 lbs a.e./A.</p> <p>Corn and ryegrass tested at concentrations 2:0.00341 lbs a.e./A.</p> <hr/> <p><i>Five test concentrations should be used with a dose range of 2X or 3X progression</i></p> <p><i>OECD recommends three concentrations, preferably with application rates equivalent to 0.0 (control), 1.0, 10.0 and 100 mg substance per kg of oven-dried soil.</i></p>
<p><u>Method and interval of analytical verification</u></p> <p>LOQ:</p> <p>LOD:</p>	<p>Duplicate samples were taken from the negative control and the treatment groups for analysis via HPLC with a Zorbax RX-C8 column with UV detection.</p> <p>0.0222 mg a.e./mL</p> <p>Not reported</p>	
<p>Adjuvant (type, percentage, if used)</p>	<p>N/A</p>	
<p><u>Test container (pot)</u></p> <p>Size/Volume</p> <p>Material: (glass/polystyrene)</p>	<p>Pots with an internal diameter of 16.5 diameter and 11.5 cm depth.</p> <p>Plastic</p>	<hr/> <p><i>Non-porous containers should be used.</i></p> <p><i>OECD recommends that non-porous plastic or glazed pot be used.</i></p>
<p>Growth facility</p>	<p>Greenhouse</p>	

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
Method/depth of seeding	Not reported	
<u>Test material application</u> Application time including the plant growth stage Number of application Application interval Method of application	At 2-4 leaf stage. 1 N/A- single application The test material was applied using a DeVries overhead track sprayer (4002 E Teejet nozzle), 27 inches above the target.	
<u>Details of soil used</u> Geographic location Depth of soil collection Soil texture % sand (>63 µm) % silt (2-63 µm) % clay (<2 µm) pH: % organic carbon CEC Moisture at 1/3 atm (%)	N/A N/A Sandy loam 72 18 10 5.9 1.5% 11.5 meq/100g 11.5%	Soil mixed with silica sand Organic matter: 2.5%. <hr/> <i>Soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter are preferable. Glass beads, rock wool, and 100% acid washed sand are not preferred.</i> <i>OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20µm) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.</i>
Details of nutrient medium, if used	Peter's 20-10-20 ½ tsp/gal plus STEM 1/8 tsp/gal for corn; Peter's 20-20-20 ½ tsp/gal all other species.	
<u>Watering regime and schedules</u> Water source/type: Volume applied: Interval of application: Method of application:	Domestic well water. Not reported. Not reported. Initial watering from the top, then plants bottom watered.	<hr/> <i>EPA prefers that bottom watering be utilized for seedling emergence studies so that the chemical is not leached out of the soil during the test.</i>

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
Any pest control method/fertilization, if used	None reported	
<u>Test conditions</u>	lettuce, radish, soybean, sugar beet, turnip	Greenhouse 7: Lettuce, radish, soybean, sugar beet, turnip
Temperature:	24.4°C±1.8 (range 16.7-28.0°C)	
Relative humidity:	46%±13 (range 19-68%);	
	carrot, cucumber, onion, corn, ryegrass	Greenhouse 8: Carrot, cucumber, onion, corn, ryegrass
Temperature:	25.7°C±2.4 (range 16.4-29.8°C)	
Relative humidity:	46%±13 (range 19-68%)	<i>EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.</i>
Photoperiod:	16L:8D	
Light intensity and quality:	Natural sunlight supplemented with artificial light. PAR: 7-15 E/m ² 19-68%	<i>OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.</i>
<u>Reference chemical (if used)</u>		
Name:	N/A	
Concentrations:		
Other parameters, if any	None	

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2. Observations:

Table 4: Observation Parameters – Vegetative Vigor.

Parameters	Vegetative Vigor	
	Details	Remarks
Parameters measured (e.g., number of germinated seeds, emerged seedlings, plant height, dry weight or other endpoints)	- Survival - Height - Total fresh weight - Phytotoxicity	
Measurement technique for each parameter	Phytotoxicity was visually determined. Survival was defined as the percent of emerged. Height was measured as mean per pot. Plant weight was measured as the total fresh weight per replicate.	
Observation intervals	Each pot was inspected weekly and phytotoxicity assessments performed. Plant height and fresh weight were recorded at study termination.	
Other observations, if any	N/A	
Were raw data included?	Yes	
Phytotoxicity rating system, if used	0- No effect; 10-30- Slight effect; 40-60- Moderate effect; 70-90- Severe effect; 100- Complete effect.	Frans, Robert E. and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

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II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

1. Vegetative Vigor:

The percent inhibitions reported were obtained by the reviewer. Negative control survival was 100% for all tested species. There were inhibitions in survival for carrot, corn, cucumber, lettuce, radish, sugar beet, soybean and turnip with maximums of 87, 10, 97, 13, 43, 33, 100 and 97%, respectively ($p < 0.05$). Survival for onion or ryegrass was similar to controls at 100%.

The study author found statistically significant ($p < 0.05$) inhibitions in weight for all species except ryegrass relative to controls. There were statistically significant ($p < 0.05$) weight inhibitions in carrot, soybean, sugarbeet and turnip beginning at 0.00171 lbs a.e./A with maximum percent inhibitions of 99, 92, 97 and 98%, respectively; for corn and onion at 0.0546 and 0.109 lbs a.e./A with maximum inhibitions of 33 and 84%, respectively; and for cucumber and radish beginning at 0.00341 lbs a.e./A with maximum inhibitions of 97 and 95%, respectively. Finally, there were inhibitions in lettuce weight beginning at 0.000855 lbs a.e./A with maximum 98%.

The study author found statistically significant ($p < 0.05$) inhibitions in height for all species except ryegrass. There were statistically significant ($p < 0.05$) height inhibitions in cucumber, radish, and soybean beginning at 0.00171 lbs a.e./A with maximum percent inhibitions of 93, 58 and 77%, respectively; for onion at 0.0546 and 0.109 lbs a.e./A with maximum inhibition of 37%; for carrot beginning at 0.00341 lbs a.e./A with maximum inhibition of 79%; for sugarbeet beginning at 0.0137 lbs a.e./A with maximum inhibition of 41%; and for turnip beginning at 0.000855 lb a.e./A with maximum inhibition of 54% ($p < 0.05$). There was also statistically significant ($p < 0.05$) height inhibition for corn at 0.109 lbs a.e./A of 14% and for lettuce beginning 0.00341 lbs a.e./A at maximum percent inhibition of 60%.

According to the study author, the most sensitive monocot was onion based on fresh weight, with NOAEC and EC₂₅ values of 0.0273 and 0.0369 lbs a.e./A, respectively. The most sensitive dicot was soybean based on height, with NOAEC and EC₂₅ values of 0.000855 and 0.000464 lb a.e./A, respectively.

There were no significant phytotoxic effects in the control, based on visual assessment of plant injury. After 21 days, treatment-related phytotoxicity was observed in all species with the exception of ryegrass.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

EPA MRID Number 493688-01

B. REPORTED STATISTICS:

Survival, dry weight, and height of the control and treatment groups were compared using SAS® System for Windows (release 8.02, 1999-2001; SAS Institute, Cary, NC). Normality and homogeneity of variance were determined using Shapiro-Wilk’s test and Levene’s test, respectively. Weight and length data were analyzed using analysis of variance (ANOVA) and Jonckheere-Terpstra. The No Effect Rate (NOER) was determined using Jonckheere-Terpstra. Survival exhibiting a dose-response relationship was analyzed using the probit method to estimate IR/ER₂₅ and IR/ER₅₀ and their 95% confidence limits. Nominal application rates in terms of mL product/ha were used, however, the rates are presented here as lb a.e. aminopyralid/A for ease of comparison to the reviewer’s results.

Table 5a: Effect of Aminopyralid on 21-Day Vegetative Vigor

Species	Results summary for fresh shoot weight (lb a.e. aminopyralid/A)									
	Replicate weight (g)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Carrot	0.14-24.29	0.00171	ND	ND	0.00162	0.00131-0.00190	0.00387	0.00316-0.00455	ND	ND
Corn	60.67-99.56	0.0273	ND	ND	0.0756	0.00434-0.0549	0.157	0.105-0.235	ND	ND
Cucumber	1.01-301.07	0.00341	ND	ND	0.00340	0.00263-0.00439	0.00796	0.00673-0.00942	ND	ND
Lettuce	1.15-77.90	0.000855	ND	ND	0.00183	0.00138-0.00241	0.00263	0.00211-0.00329	ND	ND
Onion	4.61-29.08	0.0273	ND	ND	0.0369	0.0292-0.0467	0.0588	0.0510-0.0678	ND	ND
Radish	1.61-56.71	0.00171	ND	ND	0.00343	0.00247-0.00478	0.00974	0.00783-0.0121	ND	ND
Ryegrass	12.20-14.83	0.109	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Soybean	1.83-72.58	0.000855	ND	ND	0.00105	0.000819-0.00133	0.00241	0.00204-0.00284	ND	ND
Sugarbeet	0.55-33.44	0.000855	ND	ND	0.00174	0.00126-0.00241	0.00384	0.00306-0.00482	ND	ND
Turnip	0.31-79.40	0.000855	ND	ND	0.00295	0.00208-0.00418	0.00705	0.00560-0.00883	ND	ND

ND- Not determined. NC- Not calculable. N/A- Not applicable.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

EPA MRID Number 493688-01

Table 5b: Effect of Aminopyralid on 21-Day Vegetative Vigor

Species	Results summary for height (lb a.e. aminopyralid/A)									
	Height (mm)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Carrot	63-327	0.00171	ND	ND	0.00298	0.00201-0.00444	0.0107	0.00673-0.0137	ND	ND
Corn	858-1089	0.05460	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Cucumber	55-948	0.00086	ND	ND	0.00117	0.000819-0.001674	0.0398	0.00279-0.00450	ND	ND
Lettuce	64-207	0.00683	ND	ND	0.00428	0.00206-0.00887	0.0247	0.0165-0.0370	ND	ND
Onion	262-418	0.02730	ND	ND	0.0792	0.0672-0.0934	>0.109	N/A	ND	ND
Radish	99-244	0.00086	ND	ND	0.00381	0.00196-0.00742	0.0355	0.0249-0.0504	ND	ND
Ryegrass	356-387	0.10920	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Soybean	117-516	0.00086	ND	ND	0.000464	0.000227-0.000956	0.00218	0.00138-0.00344	ND	ND
Sugarbeet	97-180	0.00683	ND	ND	0.0223	0.0165-0.0301	>0.109	N/A	ND	ND
Turnip	108-250	0.00043	ND	ND	0.00218	0.00115-0.00416	0.0302	0.0216-0.0423	ND	ND

ND- Not determined. NC- Not calculable. N/A- Not applicable.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

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Table 5c: Effect of Aminopyralid on 21-Day Vegetative Vigor

Species	Results summary for survival (lb a.e. aminopyralid/A)									
	%	NOEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	95%CI
Carrot	13-100	0.00171	ND	ND	0.00610	0.00297-0.00992	0.0155	0.00946-0.0260	ND	ND
Corn	90-100	0.109	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Cucumber	3-100	0.00683	ND	ND	0.0272	0.0221-0.0319	0.0398	0.0341-0.0467	ND	ND
Lettuce	87-100	0.00683	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Onion	100	0.109	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Radish	57-100	0.0273	ND	ND	0.0748	0.0576-0.0962	>0.109	N/A	ND	ND
Ryegrass	100	0.109	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Soybean	0-100	0.0137	ND	ND	0.0209	0.0178-0.0237	0.0258	0.0231-0.0295	ND	ND
Sugarbeet	67-100	0.00341	ND	ND	>0.109	N/A	>0.109	N/A	ND	ND
Turnip	3-100	0.0137	ND	ND	0.0343	0.0276-0.0404	0.0481	0.0409-0.0570	ND	ND

ND- Not determined. NC- Not calculable. N/A- Not applicable.

Plant Injury Index*											
Control	Carrot	Corn	Cucumber	Lettuce	Onion	Radish	Ryegrass	Soybean	Sugarbeet	Turnip	Formulation Blank
0-20	0-100	0-60	0-100	0-90	0-70	0-90	0-20	0-100	0-90	0-100	N/A

0- No effect; 10-30- Slight effect; 40-60- Moderate effect; 70-90- Severe effect; 100 = complete effect, death of entire plant.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

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C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

All analyses were conducted comparing treated to the negative control. These analyses were conducted using CETIS version 1.8.7.12 and backend settings approved for use by EFED on 3/25/14. Data for each endpoint were tested to determine if their distributions were normal and if their variances were homogeneous using Shapiro-Wilk's and Levene's tests, respectively. Data that satisfied these assumptions were subjected to Dunnett's test for non-dose-dependent trends, and data that did not satisfy these assumptions were subjected to the non-parametric MannWhitney-U and Jonckheere-Terpstra tests. For parametric data exhibiting a dose-dependent trend, William's test was not an option for analyses including more than 10 treatment level comparisons. In these cases, the reviewer selected the non-parametric analog, Jonckheere-Terpstra test to derive NOAEC/LOAEC values; the reviewer identifies these select cases in the footnotes of the tables below (*i.e.*, "forced alternate analysis to Jonckheere-Terpstra test.").

Point estimates and associated confidence bounds for the IC₀₅, IC₂₅, and IC₅₀ values for weight and height were calculated using nonlinear regression (Bruce & Versteeg method). The EC₀₅, EC₂₅, and EC₅₀ values and confidence bounds for survival were calculated using probit regression, with the exception of soybean for which the EC₅₀ was calculated using the Trimmed Spearman-Kärber method because the data did not fit the probit model. Nominal concentrations were used for all analyses; measured concentrations were not reported. Nominal formulation concentrations were reported as mL product/ha and converted to lb aminopyralid a.e./A using the concentration of 51 g a.e. aminopyralid/L reported in the certificate of analysis (Appendix A of the study report).

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

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Table 6a: Effect of Aminopyralid on 21-Day Vegetative Vigor

Species	Results summary for fresh weight (lb a.e. aminopyralid/A)									
	Mean plant weight (g)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Carrot ¹	0.0647-4.86	0.000855	0.000659	N/A-0.00106	0.00175	0.00124-0.00231	0.00345	0.0028-0.00426	N/A	N/A
Corn ²	12.8-19.9	0.0273	0.0252	N/A-0.0402	0.0804	0.0641-0.0983	0.18	0.114-0.285	N/A	N/A
Cucumber ³	1.01-50.2	0.00341	0.000684	0.000251-0.00108	0.00305	0.00234-0.00387	0.00864	0.00738-0.0101	N/A	N/A
Lettuce ⁴	0.257-15.6	0.000855	0.000351	N/A-0.000693	0.00105	0.000576-0.00162	0.00224	0.00159-0.00315	N/A	N/A
Onion ⁵	0.921-5.82	0.0273	0.019	N/A-0.0254	0.037	0.0288-0.0451	0.0588	0.0515-0.0671	N/A	N/A
Radish ⁶	0.592-11.3	0.00171	0.000624	0.000241-0.001	0.00316	0.00239-0.00406	0.00975	0.00822-0.0116	N/A	N/A
Ryegrass ⁷	2.44-2.96	0.109	NC	NC	NC	NC	NC	NC	NC	NC
Soybean ⁸	1.07-14.5	0.000855	0.000232	0.000050-0.000379	0.000916	0.000709-0.00115	0.00238	0.00202-0.0028	N/A	N/A
Sugarbeet ⁹	0.16-6.69	0.000855	0.000512	N/A-0.000823	0.00168	0.00126-0.00216	0.00385	0.0032-0.00464	N/A	N/A
Turnip ¹⁰	0.304-15.9	0.000855	0.000671	0.000138-0.00109	0.00264	0.00191-0.00349	0.00683	0.00562-0.00829	N/A	N/A

ND- Not determined. NC- Not calculable. N/A- Not applicable.

¹ Significant decrease in carrot weight, inhibition of 11-99% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

² Significant decrease in corn weight, inhibition of 18 and 33% at 0.0546 and 0.109 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

³ Significant decrease in cucumber weight, inhibition of 37-97% beginning at 0.00683 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

⁴ Significant decrease in lettuce weight, inhibition of 14-98% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁵ Significant decrease in onion weight, inhibition of 49 and 84% at 0.0546 and 0.109 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

⁶ Significant decrease in radish weight, inhibition of 39 to 95% beginning at 0.00341 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

⁷ A 5% reduction was observed in ryegrass weight at the 0.109lb a.e./A level, relative to the negative control (Williams test, p>0.05).

⁸ Significant decrease in soybean weight, inhibition of 35 to 92% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Williams test, p<0.05).

⁹ Significant decrease in sugarbeet weight, inhibition of 15 to 97% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

¹⁰ Significant decrease in turnip weight, inhibition of 22 to 98% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

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Table 6b: Effect of Aminopyralid on 21-Day Vegetative Vigor

Species	Results summary for height (lb a.e. aminopyralid/A)									
	Height (mm)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Carrot ¹	63.3-327	0.00171	0.000475	0.000163-0.00081	0.00299	0.00223-0.00389	0.0107	0.00893-0.0129	N/A	N/A
Corn ²	858-1090	0.0546	0.0514	0.0209-0.0724	0.142	0.101-0.187	0.287	0.124-0.663	N/A	N/A
Cucumber ³	55-948	0.000855	0.000237	0.000062-0.000403	0.00117	0.000901-0.00148	0.00355	0.003-0.00419	N/A	N/A
Lettuce ⁴	63.2-206	0.00171	0.000344	0.000020-0.000844	0.00428	0.00252-0.0068	0.0247	0.0183-0.0332	N/A	N/A
Onion ⁵	262-418	0.0273	0.0272	0.0118-0.0385	0.079	0.0677-0.091	0.166	0.125-0.219	N/A	N/A
Radish ⁶	99-244	0.000855	0.000153	0.000036-0.00035	0.0038	0.00256-0.00549	0.0354	0.0273-0.046	N/A	N/A
Ryegrass	356-387	0.109	NC	NC	NC	NC	NC	NC	NC	NC
Soybean ⁷	117-516	0.000427	0.0000502	N/A-0.000141	0.000464	0.000309-0.000669	0.00218	0.0017-0.00279	N/A	N/A
Sugarbeet ⁸	97-180	0.00341	0.00196	0.00102-0.00309	0.0222	0.0181-0.027	0.12	0.0944-0.152	N/A	N/A
Turnip ⁹	108-250	0.000427	0.0000497	0.000014-0.000112	0.00219	0.00159-0.00295	0.0303	0.0232-0.0396	N/A	N/A

ND- Not determined. NC- Not calculable.

¹ Significant decrease in carrot height, inhibition of 19-79% beginning at 0.00341 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

² Significant decrease in corn height, inhibition of 14% at 0.109 lb a.e./A treatment compared to the negative control (Williams test, p<0.05).

³ Significant decrease in cucumber height, inhibition of 14-93% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁴ Significant decrease in lettuce height, inhibition of 20-60% beginning at 0.00341 lb a.e./A treatment compared to the negative control (Dunnnett test, p<0.05).

⁵ Significant decrease in onion height, inhibition of 18 and 37% at 0.0546 and 0.109 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

⁶ Significant decrease in radish height, inhibition of 13 to 58% beginning at 0.00171 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).⁷ Significant decrease in soybean height, inhibition of 20 to 77% beginning at 0.000855 lb a.e./A treatment compared to the negative control (Mann-Whitney U test, p<0.05).

⁸ Significant decrease in sugarbeet height, inhibition of 12 to 41% beginning at 0.00683 lb a.e./A treatment compared to the negative control (Dunnnett test, p<0.05).

⁹ Significant decrease in turnip height, inhibition of 18 to 54% beginning at 0.000855 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05); forced alternate analysis to Jonckheere-Terpstra test.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

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Table 6c: Effect of Aminopyralid on 21-Day Vegetative Vigor

Species	Results summary for survival (lb a.e. aminopyralid/A)									
	%	NOEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	95%CI
Carrot ¹	13-100	0.00171	0.00161	0.00089-0.00246	0.00612	0.00434-0.00812	0.0155	0.0118-0.0206	1.68	1.34-2.01
Corn ²	90-100	0.0546	NC	NC	NC	NC	NC	NC	NC	NC
Cucumber ³	2.8-100	0.00683	0.0158	0.0111-0.0199	0.0273	0.0221-0.032	0.0398	0.0341-0.0467	4.09	3.06-5.13
Lettuce ⁴	87-100	0.00683	0.0202	0.0061-0.0444	0.248	0.092-5.64	1.42	0.305-325	0.891	0.374-1.41
Onion	100	0.109	NC	NC	NC	NC	NC	NC	NC	NC
Radish ⁵	57-100	0.0273	0.0394	0.0203-0.0523	0.0748	0.0578-0.0961	0.117	0.0917-0.192	3.49	1.83-5.14
Ryegrass	100	0.109	NC	NC	NC	NC	NC	NC	NC	NC
Soybean ⁶	0-100	0.0137	NC	NC	NC	NC	0.0249	0.0218-0.0284	N/A	N/A
Sugarbeet ⁷	67-100	0.00341	0.0108	0.00345-0.0203	0.115	0.0569-0.51	0.599	0.198-9.61	0.942	0.508-1.38
Turnip ⁸	3-100	0.00683	0.0211	0.0144-0.0266	0.0343	0.0274-0.0405	0.0481	0.0409-0.0568	N/A	N/A

ND- Not determined. NC- Not calculable. N/A- Not applicable.

¹ Significant decrease in carrot survival, inhibition of 7-87% beginning at 0.00341 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

² Significant decrease in corn survival, inhibition of 10% at 0.109 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

³ Significant decrease in cucumber survival, inhibition of 6-97% beginning at 0.0137 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁴ Significant decrease in lettuce survival, inhibition of 7-13% beginning at 0.0137 lb ai/A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁵ Significant decrease in radish survival, inhibition of 17 and 43% at 0.0546 and 0.109 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁶ Significant decrease in soybean survival, inhibition of 60 to 100% beginning at 0.0273 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05). Data did not fit a probit model, so the Trimmed Spearman-Kärber method was used to calculate the EC₅₀.

⁷ Significant decrease in sugarbeet survival, inhibition of 3 to 33% starting at 0.00683 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁸ Significant decrease in turnip survival, inhibition of 3 to 97% beginning at 0.0137 lb a.e./A treatment compared to the negative control (Jonckheere-Terpstra test, p<0.05).

Plant Injury Index*											
Control	Carrot	Corn	Cucumber	Lettuce	Onion	Radish	Ryegrass	Soybean	Sugarbeet	Turnip	Formulation Blank
0-20	0-100	0-60	0-100	0-90	0-70	0-90	0-20	0-100	0-90	0-100	N/A

*0- No effect; 10-30- Slight effect; 40-60- Moderate effect; 70-90- Severe effect; 100 = Complete effect, death of entire plant.

Data Evaluation Record on the Toxicity of Formulated Aminopyralid (GF-2633, 4.3% a.e. Aminopyralid, 36.1% a.e. 2,4-D) to Terrestrial Vascular Plants: Vegetative Vigor

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Most sensitive monocot: Onion, based on fresh weight.

IC ₅₀ : 0.0588 lb a.e./A	95% C.I.: 0.0515- 0.0671 lb a.e./A
IC ₂₅ : 0.037 lb a.e./A	95% C.I.: 0.0288- 0.0451 lb a.e./A
NOAEC: 0.0273 lb a.e./A	
Slope: N/A	95% C.I.: N/A

Most sensitive dicot: Soybean, based on height.

IC ₅₀ : 0.00218 lb a.e./A	95% C.I.: 0.0017-0.00279 lb a.e./A
IC ₂₅ : 0.000464 lb a.e./A	95% C.I.: 0.000309-0.000669 lb a.e./A
NOAEC: 0.000427 lb a.e./A	
Slope: N/A	95% C.I.: N/A

D. STUDY DEFICIENCIES:

The study author only measured fresh shoot weight rather than drying plants to obtain the OCSPP 850.4150-recommended dry biomass endpoint. Additionally, study authors did not provide measured concentrations of test substance for all application rates and did not include a formulation control in the study.

E. REVIEWER'S COMMENTS:

The most sensitive monocot was onion based on fresh weight, NOAEC and IC₂₅ values were 0.0273 and 0.037 lb a.e./A, respectively. The most sensitive dicot was soybean based on height, NOAEC and IC₂₅ values were 0.000427 and 0.000464 lb a.e./A, respectively. These results are similar to those of the study authors. The reviewer's results are presented in the Executive Summary and Conclusions sections of this data evaluation record (DER).

The in-life portion of this study was initiated January 16, 2014 and completed February 6, 2014.

F. CONCLUSIONS:

This toxicity study is classified as **Supplemental**. The study is scientifically sound and can be used quantitatively in risk assessment. However, the study authors measured fresh weight instead of dry weight of plants, did not provide measured concentrations, and did not include a formulation control.

Most sensitive monocot and IC₂₅: Onion based on fresh weight (0.037 lb a.e./A).

Most sensitive dicot and IC₂₅: Soybean based on height (0.000464 lb a.e./A).

III. REFERENCES:

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2. U.S. Environmental Protection Agency, Series 850- Ecological Effects Test Guidelines, OCSPP Number 850.4150: Vegetative Vigor. 2012.
3. Frans, R.E. and Talbert, R.E., Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama, 1977.
4. Rebstock, M. 2011. "GF-2633: Acute Toxicity to the Water Flea, *Daphnia magna*, Determined Under Static Test Conditions" ABC Laboratories, Inc. Study No. 66953.

CETIS Summary Report

Report Date: 22 Oct-14 16:52 (p 1 of 3)
 Test Code: 49368801 carrot | 01-1741-7636

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 05-0596-8970 Test Type: Vegetative Vigor Tier II Analyst:
 Start Date: 10 Jan-14 Protocol: OCSPP 850.4150 Plant Vegetative Vigor Diluent:
 Ending Date: Species: Daucus carota Brine:
 Duration: NA Source: NE Seed Age:

Sample ID: 05-0982-7991 Code: 49368801 carrot Client: EPA OCSPP EFED
 Sample Date: 10 Jan-14 Material: Aminopyralid Project:
 Receive Date: Source: Dow AgroSciences
 Sample Age: NA Station:

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-4747-8955	Height	0.00171	0.00341	0.002415	NA		Jonckheere-Terpstra Step-Down Test
10-2818-3119	Height	0.00171	0.00341	0.002415	17.3%		Dunnett Multiple Comparison Test
09-6225-4547	Survival	0.00171	0.00341	0.002415	NA		Jonckheere-Terpstra Step-Down Test
13-9457-1052	Survival	0.00341	0.00683	0.004826	17.3%		Mann-Whitney U Two-Sample Test
06-0813-8897	Weight	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
15-4701-2530	Weight	0.00171	0.00341	0.002415	13.3%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
15-4249-7700	Height	IC5	0.000475	0.000163	0.00081	Nonlinear Regression
		IC10	0.000946	0.000577	0.00137	
		IC25	0.00299	0.00223	0.00389	
		IC50	0.0107	0.00893	0.0129	
07-8646-6392	Survival	EC5	0.00161	0.00089	0.00246	Linear Regression (MLE)
		EC10	0.00266	0.00163	0.00381	
		EC25	0.00612	0.00434	0.00812	
		EC50	0.0155	0.0118	0.0206	
10-9595-3379	Survival	EC50	0.0123	0.00898	0.0169	Trimmed Spearman-Kärber
00-2913-5892	Weight	IC5	0.000659	N/A	0.00106	Nonlinear Regression
		IC10	0.00095	0.000458	0.00136	
		IC25	0.00175	0.00124	0.00231	
		IC50	0.00345	0.0028	0.00426	

CETIS Summary Report

Report Date: 22 Oct-14 16:52 (p 2 of 3)
Test Code: 49368801 carrot | 01-1741-7636

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	298	271	325	263	321	10.4	25.4	8.52%	0.0%
0.000532		6	327	303	350	309	366	9.16	22.4	6.87%	-9.57%
0.000106		6	317	297	336	293	345	7.69	18.8	5.95%	-6.18%
0.000213		6	308	287	330	275	330	8.26	20.2	6.56%	-3.46%
0.000427		6	315	294	337	283	336	8.47	20.7	6.57%	-5.83%
0.000855		6	310	295	326	292	330	5.92	14.5	4.67%	-4.13%
0.00171		6	296	265	328	263	342	12.2	30	10.1%	0.62%
0.00341		6	241	219	264	217	269	8.59	21	8.72%	19.0%
0.00683		6	184	148	220	125	226	13.9	33.9	18.4%	38.3%
0.0137		3	138	118	157	129	143	4.51	7.81	5.67%	53.8%
0.0273		4	63.3	1.49	125	18	105	19.4	38.8	61.4%	78.8%
0.0546		4	65	24.2	106	28	86.8	12.8	25.7	39.5%	78.2%
0.109		2	71.9	10.2	133	67	76.7	4.85	6.86	9.55%	75.9%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	6.67%
0.00683		6	0.667	0.45	0.883	0.4	1	0.0843	0.207	31.0%	33.3%
0.0137		6	0.267	0	0.583	0	0.6	0.123	0.301	113.0%	73.3%
0.0273		6	0.2	0.0123	0.388	0	0.4	0.073	0.179	89.4%	80.0%
0.0546		6	0.367	0.00516	0.728	0	0.8	0.141	0.344	93.9%	63.3%
0.109		6	0.133	0	0.388	0	0.6	0.0989	0.242	182.0%	86.7%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	4.57	4.15	5	4.2	5.19	0.165	0.403	8.82%	0.0%
0.000532		6	4.86	4.43	5.29	4.33	5.27	0.167	0.408	8.4%	-6.25%
0.000106		6	4.78	4.18	5.38	3.82	5.32	0.233	0.571	12.0%	-4.44%
0.000213		6	4.57	4.22	4.91	4.11	5	0.133	0.325	7.11%	0.17%
0.000427		6	4.62	4.16	5.08	4	5.04	0.179	0.438	9.47%	-1.11%
0.000855		6	4.47	4.23	4.71	4.15	4.71	0.0923	0.226	5.06%	2.19%
0.00171		6	4.07	3.6	4.54	3.4	4.71	0.182	0.446	11.0%	11.0%
0.00341		6	2.79	2.3	3.28	2.23	3.4	0.192	0.471	16.9%	39.0%
0.00683		6	0.737	0.325	1.15	0.116	1.19	0.16	0.393	53.3%	83.9%
0.0137		3	0.202	-0.191	0.595	0.067	0.376	0.0913	0.158	78.2%	95.6%
0.0273		4	0.144	0.0742	0.214	0.096	0.202	0.0219	0.0438	30.4%	96.9%
0.0546		4	0.0647	0.0164	0.113	0.0398	0.106	0.0152	0.0303	46.9%	98.6%
0.109		2	0.0847	-0.25	0.419	0.0583	0.111	0.0263	0.0372	44.0%	98.1%

CETIS Summary Report

Report Date: 22 Oct-14 16:52 (p 3 of 3)
 Test Code: 49368801 carrot | 01-1741-7636

OCSP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	321	319	289	263	320	276
0.0000532		366	328	310	310	337	309
0.000106		315	300	325	293	321	345
0.000213		320	275	304	299	322	330
0.000427		321	283	297	326	336	329
0.000855		330	292	317	295	311	318
0.00171		321	272	263	286	342	294
0.00341		269	227	246	217	227	263
0.00683		174	199	226	194	125	186
0.0137				143		129	141
0.0273		105		84		18	46
0.0546		28	70	86.8		75.3	
0.109				67		76.7	

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	0.8	1	0.8
0.00683		0.6	1	0.6	0.6	0.4	0.8
0.0137		0	0	0.4	0	0.6	0.6
0.0273		0.2	0	0.4	0	0.4	0.2
0.0546		0.6	0.2	0.8	0	0.6	0
0.109		0	0	0.2	0	0.6	0

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	4.76	4.79	4.26	4.2	5.19	4.23
0.0000532		5.17	5.12	4.38	4.88	4.33	5.27
0.000106		4.95	3.82	4.91	4.41	5.32	5.25
0.000213		4.49	4.11	4.48	4.44	4.88	5
0.000427		4.2	4	4.61	4.88	5.04	5.01
0.000855		4.34	4.15	4.35	4.61	4.67	4.71
0.00171		3.97	3.82	3.4	4.25	4.26	4.71
0.00341		3.15	2.31	3	2.23	2.66	3.4
0.00683		0.637	0.744	1.19	0.607	0.116	1.13
0.0137				0.067		0.163	0.376
0.0273		0.096		0.135		0.143	0.202
0.0546		0.0443	0.106	0.0398		0.0687	
0.109				0.111		0.0583	

CETIS Summary Report

Report Date: 21 Oct-14 08:54 (p 1 of 2)
 Test Code: 49368801 corn | 07-9873-4693

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 11-9349-3588	Test Type: Vegetative Vigor Tier II	Analyst:
Start Date: 10 Jan-14	Protocol: OCSPP 850.4150 Plant Vegetative Vigor	Diluent:
Ending Date: 24 Jun-14 12:37	Species: Zea mays	Brine:
Duration: 165d 13h	Source: Syngenta Seed Care	Age:
Sample ID: 15-2097-0160	Code: 49368801 corn	Client: EPA OCSPP EFED
Sample Date: 10 Jan-14	Material: Aminopyralid	Project:
Receive Date: 24 Jun-14 12:37	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-2816-5883	Height	0.0546	0.109	0.07715	8.54%		Dunnett Multiple Comparison Test
15-7554-1811	Height	0.0546	0.109	0.07715	6.51%		Williams Multiple Comparison Test
02-5123-0772	Survival	0.0546	0.109	0.07715	NA		Jonckheere-Terpstra Step-Down Test
03-7786-0020	Survival	0.109	>0.109	NA	9.69%		Mann-Whitney U Two-Sample Test
12-2616-0003	Weight	0.0273	0.0546	0.03861	NA		Jonckheere-Terpstra Step-Down Test
11-4439-8896	Weight	0.0273	0.0546	0.03861	11.0%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
11-8684-4577	Height	IC5	0.0514	0.0209	0.0724	Nonlinear Regression
		IC10	0.0751	0.0558	0.0933	
		IC25	0.142	0.101	0.187	
		IC50	0.287	0.124	0.663	
08-8975-6087	Weight	IC5	0.0252	N/A	0.0402	Nonlinear Regression
		IC10	0.0389	0.0204	0.0564	
		IC25	0.0804	0.0641	0.0983	
		IC50	0.18	0.114	0.285	

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	999	967	1030	958	1040	12.3	30.2	3.02%	0.0%
0.00341		6	1030	969	1100	958	1090	24.8	60.8	5.88%	-3.42%
0.00683		6	1030	988	1080	965	1080	18	44.1	4.27%	-3.56%
0.0137		6	1090	1060	1120	1040	1120	12.4	30.3	2.78%	-9.05%
0.0273		6	1040	957	1110	937	1130	30.6	75.1	7.25%	-3.68%
0.0546		6	968	916	1020	908	1030	20.3	49.8	5.15%	3.04%
0.109		6	858	746	969	661	981	43.4	106	12.4%	14.1%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0273		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0546		6	1	1	1	1	1	0	0	0.0%	0.0%
0.109		6	0.9	0.643	1	0.4	1	0.1	0.245	27.2%	10.0%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	19.1	17.7	20.6	17.9	21.8	0.575	1.41	7.37%	0.0%
0.00341		6	18.9	17.3	20.5	17.2	21	0.613	1.5	7.93%	1.11%
0.00683		6	18.2	16.7	19.7	16.7	20.8	0.59	1.44	7.93%	4.78%
0.0137		6	19.9	18.8	21	18.8	21.5	0.418	1.02	5.14%	-4.06%
0.0273		6	18.1	16.3	19.8	16.2	20.9	0.68	1.67	9.23%	5.64%
0.0546		6	15.6	12.7	18.6	13.1	21	1.13	2.78	17.8%	18.3%
0.109		6	12.8	9.39	16.2	6.47	15.1	1.32	3.23	25.3%	33.2%

CETIS Summary Report

Report Date: 21 Oct-14 08:54 (p 2 of 2)
Test Code: 49368801 corn | 07-9873-4693

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1010	1010	1020	967	958	1040
0.00341		959	958	1090	1090	1040	1060
0.00683		995	1080	965	1050	1070	1060
0.0137		1040	1110	1100	1120	1060	1090
0.0273		937	1070	1090	1020	1130	967
0.0546		908	1030	940	946	958	1030
0.109		893	864	661	981	892	855

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	1	1	1	1	1
0.0273		1	1	1	1	1	1
0.0546		1	1	1	1	1	1
0.109		1	1	0.4	1	1	1

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	17.9	19	19.1	17.9	19.1	21.8
0.00341		18.1	17.2	18.1	18.6	20.5	21
0.00683		17.9	18.4	17.1	16.7	18.6	20.8
0.0137		19.2	19.5	18.8	19.6	21.5	20.8
0.0273		17.3	16.2	17.2	17.6	20.9	19.1
0.0546		15.5	15.1	15.2	13.1	14	21
0.109		15.1	14.5	6.47	14.7	13	12.8

CETIS Summary Report

Report Date: 22 Oct-14 16:55 (p 1 of 3)
 Test Code: 49368801 cucumb | 11-4744-8566

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 07-7967-0178 Test Type: Vegetative Vigor Tier II Analyst:
 Start Date: 10 Jan-14 Protocol: OCSPP 850.4150 Plant Vegetative Vigor Diluent:
 Ending Date: 24 Jun-14 12:19 Species: Cucumis sativus Brine:
 Duration: 165d 12h Source: NE Seed Age:

Sample ID: 18-7937-3607 Code: 49368801 cucumb Client: EPA OCSPP EFED
 Sample Date: 10 Jan-14 Material: Aminopyralid Project:
 Receive Date: 24 Jun-14 12:19 Source: Dow AgroSciences
 Sample Age: NA Station:

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-3911-8836	Height	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
20-1638-2259	Survival	0.00683	0.0137	0.009673	NA		Jonckheere-Terpstra Step-Down Test
13-3433-5809	Survival	0.0137	0.0273	0.01934	9.26%		Mann-Whitney U Two-Sample Test
11-3391-5638	Weight	0.00341	0.00683	0.004826	NA		Jonckheere-Terpstra Step-Down Test
13-4582-5021	Weight	0.00341	0.00683	0.004826	33.2%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
01-6175-4340	Height	IC5	0.000237	6.22E-05	0.000403	Nonlinear Regression
		IC10	0.000431	0.000269	0.000608	
		IC25	0.00117	0.000901	0.00148	
		IC50	0.00355	0.003	0.00419	
12-5242-3660	Survival	EC5	0.0158	0.0111	0.0199	Linear Regression (MLE)
		EC10	0.0194	0.0144	0.0236	
		EC25	0.0273	0.0221	0.032	
		EC50	0.0398	0.0341	0.0467	
10-1764-5511	Survival	EC50	0.0404	0.0346	0.0472	Trimmed Spearman-Kärber
17-9981-3899	Weight	IC5	0.000684	0.000251	0.00108	Nonlinear Regression
		IC10	0.0012	0.000757	0.00167	
		IC25	0.00305	0.00234	0.00387	
		IC50	0.00864	0.00738	0.0101	

CETIS Summary Report

Report Date: 22 Oct-14 16:55 (p 2 of 3)
 Test Code: 49368801 cucumb | 11-4744-8566

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	834	679	988	646	1020	60	147	17.6%	0.0%
0.0000532		6	901	844	958	792	935	22.2	54.3	6.03%	-8.13%
0.000106		6	948	872	1020	850	1020	29.8	72.9	7.69%	-13.7%
0.000213		6	874	777	971	797	1030	37.7	92.4	10.6%	-4.84%
0.000427		6	874	801	948	804	965	28.7	70.2	8.03%	-4.9%
0.000855		6	778	687	869	677	913	35.4	86.8	11.2%	6.64%
0.00171		6	720	576	864	538	894	55.9	137	19.0%	13.6%
0.00341		6	481	412	549	393	564	26.7	65.5	13.6%	42.4%
0.00683		6	231	199	263	180	275	12.5	30.5	13.2%	72.3%
0.0137		6	147	90	203	97.6	246	22	53.9	36.8%	82.4%
0.0273		6	101	90.3	112	91.6	120	4.27	10.4	10.3%	87.9%
0.0546		4	86.1	57.5	115	65	107	9.01	18	20.9%	89.7%
0.109		1	55			55	55	0	0	0.0%	93.4%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	0.944	0.854	1	0.833	1	0.0351	0.0861	9.11%	5.56%
0.0273		6	0.806	0.674	0.937	0.667	1	0.0512	0.125	15.6%	19.4%
0.0546		6	0.278	0	0.563	0	0.667	0.111	0.272	98.0%	72.2%
0.109		6	0.0278	0	0.0992	0	0.167	0.0278	0.068	245.0%	97.2%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	37.8	28.3	47.3	26.4	52.3	3.7	9.05	23.9%	0.0%
0.0000532		6	42.1	36.1	48.1	34.8	49.1	2.33	5.7	13.5%	-11.3%
0.000106		6	50.2	46.3	54	43.9	54	1.5	3.66	7.3%	-32.6%
0.000213		6	47.9	42.6	53.3	44.4	58	2.1	5.14	10.7%	-26.7%
0.000427		6	48.8	46.1	51.4	44.9	52.7	1.03	2.53	5.18%	-28.9%
0.000855		6	46.7	43.2	50.2	43.2	52.2	1.36	3.33	7.14%	-23.3%
0.00171		6	42	38.4	45.5	36.9	47.3	1.38	3.37	8.03%	-10.9%
0.00341		6	33.9	30.3	37.5	29.7	38.6	1.41	3.45	10.2%	10.5%
0.00683		6	23.8	20.8	26.9	19.4	27.6	1.18	2.89	12.1%	37.0%
0.0137		6	15.5	10.3	20.7	9.01	22.4	2.03	4.97	32.1%	59.0%
0.0273		6	10.4	8.04	12.8	8.29	14.9	0.931	2.28	21.9%	72.4%
0.0546		4	7.86	5.56	10.2	5.91	8.96	0.722	1.44	18.4%	79.2%
0.109		1	1.01			1.01	1.01	0	0	0.0%	97.3%

CETIS Summary Report

Report Date: 22 Oct-14 16:55 (p 3 of 3)
 Test Code: 49368801 cucumb | 11-4744-8566

OCSP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	922	1020	646	739	733	944
0.0000532		935	792	911	930	922	919
0.000106		1020	967	850	864	998	989
0.000213		941	798	797	839	841	1030
0.000427		965	886	833	811	804	948
0.000855		838	790	713	677	740	913
0.00171		894	600	538	822	785	683
0.00341		459	469	552	446	393	564
0.00683		233	275	180	237	233	227
0.0137		246	107	158	123	97.6	149
0.0273		96.8	104	120	92.7	103	91.6
0.0546		107	65	79.5		93	
0.109					55		

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	0.833	1	1	0.833	1
0.0273		0.833	0.667	0.833	1	0.667	0.833
0.0546		0.167	0.667	0.333	0	0.5	0
0.109		0	0	0	0.167	0	0

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	31.2	52.3	35.4	40.1	41.7	26.4
0.0000532		42.5	40.3	37.7	34.8	49.1	48.2
0.000106		54	51.6	49.9	43.9	53.1	48.7
0.000213		45.4	48.4	45	44.4	46.5	58
0.000427		49.8	44.9	48.1	48.7	48.5	52.7
0.000855		46.2	43.2	48.5	43.7	46.2	52.2
0.00171		47.3	40.6	36.9	41.7	42.5	42.9
0.00341		29.7	31.1	38.6	34.7	32.4	36.8
0.00683		19.4	21.9	23.8	25.2	27.6	25.3
0.0137		22.4	9.01	19.3	14.2	11.5	16.6
0.0273		8.29	9.78	10.2	10	14.9	9.47
0.0546		8.96	5.91	7.63		8.95	
0.109					1.01		

CETIS Summary Report

Report Date: 22 Oct-14 16:58 (p 1 of 3)
 Test Code: 49368801 lettuc | 05-9780-2185

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 16-1179-3614 Test Type: Vegetative Vigor Tier II Analyst:
 Start Date: 10 Jan-14 Protocol: OCSPP 850.4150 Plant Vegetative Vigor Diluent:
 Ending Date: 24 Jun-14 12:25 Species: Lactuca sativa Brine:
 Duration: 165d 12h Source: Sustainable Seed Co., CA Age:

Sample ID: 12-1386-5748 Code: 49368801 lettuc Client: EPA OCSPP EFED
 Sample Date: 10 Jan-14 Material: Aminopyralid Project:
 Receive Date: 24 Jun-14 12:25 Source: Dow AgroSciences
 Sample Age: NA Station:

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-3073-1660	Height	0.00683	0.0137	0.009673	NA		Jonckheere-Terpstra Step-Down Test
20-5911-3356	Height	0.00171	0.00341	0.002415	14.8%		Dunnett Multiple Comparison Test
18-0831-2030	Survival	0.00683	0.0137	0.009673	NA		Jonckheere-Terpstra Step-Down Test
14-2868-7925	Survival	0.109	>0.109	NA	7.51%		Mann-Whitney U Two-Sample Test
20-4354-3269	Weight	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
10-3647-9603	Weight	0.000427	0.000855	0.0006042	12.0%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
05-6396-6880	Height	IC5	0.000344	1.98E-05	0.000844	Nonlinear Regression
		IC10	0.000883	0.000323	0.00171	
		IC25	0.00428	0.00252	0.0068	
		IC50	0.0247	0.0183	0.0332	
10-1921-5378	Survival	EC5	0.0202	0.0061	0.0444	Linear Regression (MLE)
		EC10	0.0517	0.024	0.191	
		EC25	0.248	0.092	5.64	
		EC50	1.42	0.305	325	
16-0361-6471	Weight	IC5	0.000351	N/A	0.000693	Nonlinear Regression
		IC10	0.000529	N/A	0.000903	
		IC25	0.00105	0.000576	0.00162	
		IC50	0.00224	0.00159	0.00315	

CETIS Summary Report

Report Date: 22 Oct-14 16:58 (p 2 of 3)
 Test Code: 49368801 lettuc | 05-9780-2185

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	156	143	170	136	171	5.32	13	8.35%	0.0%
0.0000133		6	157	149	165	147	166	3.18	7.8	4.96%	-0.56%
0.0000267		6	160	146	175	147	185	5.65	13.8	8.65%	-2.5%
0.0000532		6	165	153	176	153	184	4.49	11	6.68%	-5.36%
0.000106		6	163	149	177	142	181	5.6	13.7	8.4%	-4.42%
0.000213		6	166	146	187	150	205	8.07	19.8	11.9%	-6.59%
0.000427		6	173	153	193	146	195	7.8	19.1	11.1%	-10.7%
0.000855		6	188	172	204	166	210	6.28	15.4	8.18%	-20.4%
0.00171		6	206	176	237	181	246	11.9	29.1	14.1%	-32.2%
0.00341		6	125	105	145	98	153	7.74	19	15.2%	20.0%
0.00683		6	93.4	86.2	101	82.2	101	2.81	6.89	7.38%	40.2%
0.0137		6	70.8	54.6	87.1	46	84.4	6.33	15.5	21.9%	54.7%
0.0273		6	63.2	49.4	77	43.7	83.5	5.38	13.2	20.8%	59.5%
0.0546		6	68.8	56.9	80.7	52.5	81.2	4.62	11.3	16.5%	55.9%
0.109		6	68.2	61.2	75.2	59.6	76.8	2.74	6.7	9.83%	56.3%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000133		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000267		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	6.67%
0.0273		6	0.867	0.695	1	0.6	1	0.0667	0.163	18.8%	13.3%
0.0546		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	10.0%
0.109		6	0.9	0.724	1	0.6	1	0.0683	0.167	18.6%	10.0%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	15.6	14.1	17	13.9	17.3	0.567	1.39	8.92%	0.0%
0.0000133		6	14.4	12.5	16.2	11.8	16.7	0.724	1.77	12.3%	7.79%
0.0000267		6	15	12.6	17.3	11.8	17.9	0.917	2.25	15.0%	3.82%
0.0000532		6	14.5	12.6	16.4	11.7	16.2	0.737	1.8	12.4%	6.83%
0.000106		6	14.4	11.2	17.7	10.9	19.9	1.26	3.09	21.4%	7.27%
0.000213		6	14.9	12.7	17.1	12	17.7	0.852	2.09	14.0%	4.56%
0.000427		6	14.8	13.6	16.1	13.5	16.3	0.491	1.2	8.11%	4.78%
0.000855		6	13.7	11.6	15.8	11.3	16.4	0.825	2.02	14.7%	12.0%
0.00171		6	13.4	10.8	16.1	10.8	17.2	1.03	2.52	18.7%	13.8%
0.00341		6	3.86	0.759	6.95	1.49	8.77	1.2	2.95	76.5%	75.2%
0.00683		6	0.701	0.508	0.895	0.457	0.951	0.0753	0.184	26.3%	95.5%
0.0137		6	0.374	0.236	0.512	0.146	0.508	0.0536	0.131	35.1%	97.6%
0.0273		6	0.275	0.217	0.332	0.191	0.349	0.0224	0.0548	20.0%	98.2%
0.0546		6	0.289	0.192	0.387	0.107	0.355	0.0379	0.0929	32.1%	98.1%
0.109		6	0.257	0.115	0.398	0.142	0.503	0.0549	0.135	52.4%	98.4%

CETIS Summary Report

Report Date: 22 Oct-14 16:58 (p 3 of 3)
Test Code: 49368801 lettuc | 05-9780-2185

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	166	171	148	136	163	153
0.0000133		166	147	166	157	156	151
0.0000267		164	160	150	147	185	154
0.0000532		164	168	159	159	184	153
0.000106		181	152	170	165	168	142
0.000213		158	150	155	164	205	166
0.000427		193	175	195	146	171	158
0.000855		179	210	184	199	190	166
0.00171		240	199	181	183	246	190
0.00341		126	153	118	117	138	98
0.00683		89	98.6	93.6	101	82.2	96.2
0.0137		82	65.2	84.4	63	84.4	46
0.0273		68.6	83.5	58.2	43.7	65.8	59.5
0.0546		81.2	52.5	70.8	81.2	61.3	66
0.109		72.3	61	76.8	71	68.4	59.6

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000133		1	1	1	1	1	1
0.0000267		1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	1	1	0.8	1	0.8
0.0273		1	0.8	1	0.6	1	0.8
0.0546		1	0.8	0.8	0.8	1	1
0.109		0.8	1	1	0.6	1	1

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	17.3	13.9	14.5	15.2	17.2	15.4
0.0000133		14.4	13.3	14.1	11.8	15.9	16.7
0.0000267		16.6	14.6	13.3	11.8	17.9	15.8
0.0000532		15.3	11.7	15.5	12.8	16.2	15.7
0.000106		10.9	14.3	15.4	12.4	19.9	13.8
0.000213		12	15.4	12.9	15.7	15.6	17.7
0.000427		13.6	16.1	13.5	14.4	15.1	16.3
0.000855		11.3	15.2	11.5	14.1	13.7	16.4
0.00171		12.7	12.3	11.8	10.8	17.2	15.9
0.00341		1.49	8.77	3.18	1.65	6.08	1.97
0.00683		0.457	0.802	0.626	0.951	0.812	0.56
0.0137		0.486	0.413	0.327	0.363	0.508	0.146
0.0273		0.239	0.308	0.349	0.191	0.281	0.279
0.0546		0.323	0.107	0.291	0.354	0.355	0.305
0.109		0.296	0.142	0.202	0.252	0.503	0.145

CETIS Summary Report

Report Date: 22 Oct-14 17:03 (p 1 of 3)
 Test Code: 49368801 onion | 12-7500-0152

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 00-5568-1541 Test Type: Vegetative Vigor Tier II Analyst:
 Start Date: 10 Jan-14 Protocol: OCSPP 850.4150 Plant Vegetative Vigor Diluent:
 Ending Date: 24 Jun-14 12:40 Species: Allium cepa Brine:
 Duration: 165d 13h Source: Park Seed Co. Age:

Sample ID: 02-9854-8599 Code: 49368801 onion Client: EPA OCSPP EFED
 Sample Date: 10 Jan-14 Material: Aminopyralid Project:
 Receive Date: 24 Jun-14 12:40 Source: Dow AgroSciences
 Sample Age: NA Station:

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-7441-6347	Height	0.0273	0.0546	0.03861	NA		Jonckheere-Terpstra Step-Down Test
00-6219-9098	Height	0.0273	0.0546	0.03861	12.4%		Dunnett Multiple Comparison Test
00-3647-3944	Survival	0.109	>0.109	NA	NA		Jonckheere-Terpstra Step-Down Test
20-0352-4942	Survival	0.109	>0.109	NA	NA		Mann-Whitney U Two-Sample Test
01-8846-5348	Weight	0.0273	0.0546	0.03861	NA		Jonckheere-Terpstra Step-Down Test
01-9866-5162	Weight	<0.000053	0.0000532	NA	22.3%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
01-5028-0261	Height	IC5	0.0272	0.0118	0.0385	Nonlinear Regression
		IC10	0.0406	0.0272	0.0531	
		IC25	0.079	0.0677	0.091	
		IC50	0.166	0.125	0.219	
02-2085-6196	Weight	IC5	0.019	N/A	0.0254	Nonlinear Regression
		IC10	0.0244	0.0142	0.0314	
		IC25	0.037	0.0288	0.0451	
		IC50	0.0588	0.0515	0.0671	

CETIS Summary Report

Report Date: 22 Oct-14 17:03 (p 2 of 3)
Test Code: 49368801 onion | 12-7500-0152

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	415	387	442	371	442	10.6	26	6.28%	0.0%
0.000532		6	387	353	421	347	442	13.2	32.4	8.38%	6.72%
0.000106		6	376	325	427	318	429	19.9	48.7	13.0%	9.28%
0.000213		6	407	360	454	327	463	18.3	44.9	11.0%	1.91%
0.000427		6	406	390	422	385	428	6.3	15.4	3.8%	2.06%
0.000855		6	411	357	465	349	482	20.8	51	12.4%	0.88%
0.00171		5	388	339	438	336	440	17.9	39.9	10.3%	6.34%
0.00341		6	418	377	458	357	466	15.9	38.9	9.31%	-0.69%
0.00683		6	411	394	427	394	434	6.48	15.9	3.87%	0.97%
0.0137		6	402	359	446	350	473	17	41.6	10.3%	2.96%
0.0273		6	380	355	404	350	403	9.58	23.5	6.18%	8.45%
0.0546		6	339	316	363	309	373	9.07	22.2	6.55%	18.1%
0.109		6	262	234	289	225	297	10.6	25.9	9.91%	36.9%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		5	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0273		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0546		6	1	1	1	1	1	0	0	0.0%	0.0%
0.109		6	1	1	1	1	1	0	0	0.0%	0.0%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	5.82	4.74	6.89	4.91	7.7	0.42	1.03	17.7%	0.0%
0.000532		6	4.49	3.87	5.1	3.84	5.29	0.238	0.583	13.0%	22.9%
0.000106		6	5.29	4.39	6.19	4.33	6.87	0.35	0.857	16.2%	9.1%
0.000213		6	5.25	3.78	6.72	3.38	7.05	0.572	1.4	26.7%	9.76%
0.000427		6	5.11	4.24	5.99	4.04	5.77	0.34	0.833	16.3%	12.1%
0.000855		6	5.1	4.61	5.59	4.4	5.7	0.191	0.467	9.16%	12.3%
0.00171		5	4.81	3.39	6.24	3.92	6.76	0.514	1.15	23.9%	17.2%
0.00341		6	5.62	4.91	6.33	4.83	6.48	0.276	0.675	12.0%	3.32%
0.00683		6	5.27	4.59	5.94	4.53	6.18	0.263	0.643	12.2%	9.43%
0.0137		6	5.27	4.21	6.34	4.21	6.91	0.416	1.02	19.3%	9.3%
0.0273		6	4.23	3.37	5.09	3.45	5.33	0.335	0.82	19.4%	27.3%
0.0546		6	2.99	1.87	4.1	1.65	4.6	0.435	1.07	35.7%	48.7%
0.109		6	0.921	0.686	1.16	0.574	1.15	0.0915	0.224	24.3%	84.2%

CETIS Summary Report

Report Date: 22 Oct-14 17:03 (p 3 of 3)
 Test Code: 49368801 onion | 12-7500-0152

OCSP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	432	423	422	442	397	371
0.0000532		396	347	379	367	442	389
0.000106		429	318	427	384	380	320
0.000213		420	420	399	411	463	327
0.000427		414	399	413	385	428	397
0.000855		455	349	482	381	421	378
0.00171		374	336	376	440	415	
0.00341		437	398	466	357	406	442
0.00683		421	404	395	416	434	394
0.0137		401	374	473	350	403	414
0.0273		386	351	396	350	392	403
0.0546		346	350	309	373	324	335
0.109		264	239	269	275	225	297

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	1	1	1	1	1
0.0273		1	1	1	1	1	1
0.0546		1	1	1	1	1	1
0.109		1	1	1	1	1	1

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	5.25	5.72	6.18	7.7	4.91	5.14
0.0000532		3.84	4.24	5.13	4.12	4.3	5.29
0.000106		5.28	4.33	5.31	6.87	5.11	4.82
0.000213		5.31	7.05	4.11	5.07	6.57	3.38
0.000427		4.06	5.77	4.04	5.67	5.74	5.39
0.000855		5.29	5.09	4.4	5.7	5.37	4.74
0.00171		3.92	3.98	4.74	6.76	4.67	
0.00341		5.2	6.48	4.83	5.16	5.71	6.35
0.00683		4.65	5.23	6.18	5.82	5.2	4.53
0.0137		4.5	5.17	6.91	4.21	4.83	6.04
0.0273		3.45	5.14	3.84	4.14	3.49	5.33
0.0546		3.23	2.79	2.07	4.6	1.65	3.58
0.109		0.574	1.05	0.721	1.05	1.15	0.974

CETIS Summary Report

Report Date: 22 Oct-14 16:50 (p 1 of 3)
 Test Code: 49368801 radish | 15-8180-4218

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 15-3034-2441	Test Type: Vegetative Vigor Tier II	Analyst:
Start Date: 10 Jan-14	Protocol: OCSPP 850.4150 Plant Vegetative Vigor	Diluent:
Ending Date: 24 Jun-14 12:30	Species: Raphanus sativus	Brine:
Duration: 165d 13h	Source: Sustainable Seed Co., CA	Age:

Sample ID: 10-8436-9854	Code: 49368801 radish	Client: EPA OCSPP EFED
Sample Date: 10 Jan-14	Material: Aminopyralid	Project:
Receive Date: 24 Jun-14 12:30	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-6015-7080	Height	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
08-4743-0755	Height	0.000855	0.00171	0.001209	9.68%		Mann-Whitney U Two-Sample Test
11-2263-2601	Survival	0.0273	0.0546	0.03861	NA		Jonckheere-Terpstra Step-Down Test
08-0408-3621	Survival	0.0546	0.109	0.07715	10.7%		Mann-Whitney U Two-Sample Test
07-7280-4524	Weight	0.00171	0.00341	0.002415	NA		Jonckheere-Terpstra Step-Down Test
13-7947-7057	Weight	0.00171	0.00341	0.002415	15.4%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
12-7477-0252	Height	IC5	0.000153	3.59E-05	0.00035	Nonlinear Regression
		IC10	0.00051	0.000249	0.000894	
		IC25	0.0038	0.00256	0.00549	
		IC50	0.0354	0.0273	0.046	
00-9741-0040	Survival	EC5	0.0394	0.0203	0.0523	Linear Regression (MLE)
		EC10	0.0501	0.031	0.0635	
		EC25	0.0748	0.0578	0.0961	
		EC50	0.117	0.0917	0.192	
16-2303-4433	Weight	IC5	0.000624	0.000241	0.001	Nonlinear Regression
		IC10	0.00115	0.000715	0.00162	
		IC25	0.00316	0.00239	0.00406	
		IC50	0.00975	0.00822	0.0116	

CETIS Summary Report

Report Date: 22 Oct-14 16:50 (p 2 of 3)
 Test Code: 49368801 radish | 15-8180-4218

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	236	224	247	220	246	4.35	10.7	4.53%	0.0%
0.0000133		6	228	209	247	203	254	7.43	18.2	8.0%	3.41%
0.0000267		6	233	215	252	209	260	7.17	17.6	7.53%	0.95%
0.0000532		6	229	224	234	223	235	1.97	4.81	2.1%	2.83%
0.000106		6	244	227	260	220	264	6.55	16	6.59%	-3.35%
0.000213		6	242	225	258	221	262	6.44	15.8	6.53%	-2.57%
0.000427		6	229	209	250	206	254	8	19.6	8.55%	2.79%
0.000855		6	230	214	247	210	253	6.53	16	6.95%	2.26%
0.00171		6	204	190	218	185	219	5.56	13.6	6.68%	13.4%
0.00341		6	162	137	188	117	186	9.87	24.2	14.9%	31.1%
0.00683		6	160	146	173	141	174	5.18	12.7	7.95%	32.3%
0.0137		6	144	127	160	130	164	6.37	15.6	10.9%	39.1%
0.0273		6	129	93.5	164	75	167	13.7	33.5	26.0%	45.4%
0.0546		6	103	52.8	153	28.2	166	19.4	47.6	46.3%	56.4%
0.109		6	99	72.5	125	67.5	135	10.3	25.3	25.5%	58.0%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000133		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000267		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0273		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0546		6	0.833	0.554	1	0.4	1	0.109	0.266	31.9%	16.7%
0.109		6	0.567	0.258	0.876	0.2	1	0.12	0.294	52.0%	43.3%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	11.2	10.4	12.1	10.1	12.3	0.348	0.853	7.58%	0.0%
0.0000133		6	10.8	9.88	11.8	9.57	12.1	0.376	0.921	8.49%	3.53%
0.0000267		6	10.8	9.16	12.4	8.97	13	0.637	1.56	14.4%	4.0%
0.0000532		6	10.4	8.83	11.9	7.98	12.6	0.606	1.48	14.3%	7.64%
0.000106		6	11.3	10.6	12.1	10.4	12.1	0.305	0.748	6.59%	-0.85%
0.000213		6	11.3	9.82	12.7	10	13	0.558	1.37	12.2%	-0.03%
0.000427		6	10.9	9.14	12.6	9.02	12.7	0.671	1.64	15.1%	3.41%
0.000855		6	11	10.1	11.9	10.1	12.3	0.357	0.874	7.93%	2.05%
0.00171		6	10.1	8.78	11.4	8.63	11.7	0.512	1.25	12.4%	10.3%
0.00341		6	6.84	5.5	8.18	5.2	8.56	0.522	1.28	18.7%	39.2%
0.00683		6	5.9	5.22	6.57	4.98	6.85	0.261	0.639	10.8%	47.6%
0.0137		6	4.68	3.17	6.19	1.96	5.7	0.588	1.44	30.8%	58.4%
0.0273		6	3.99	2.8	5.17	2.63	5.31	0.461	1.13	28.3%	64.6%
0.0546		6	1.56	0.559	2.55	0.58	3.22	0.388	0.95	61.0%	86.2%
0.109		6	0.592	0.31	0.874	0.334	1.02	0.11	0.269	45.5%	94.7%

CETIS Summary Report

Report Date: 22 Oct-14 16:50 (p 3 of 3)
 Test Code: 49368801 radish | 15-8180-4218

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	242	245	220	226	246	234
0.0000133		222	236	237	215	254	203
0.0000267		260	239	209	223	228	242
0.0000532		223	225	235	231	227	233
0.000106		231	242	248	264	256	220
0.000213		258	262	231	221	241	238
0.000427		233	247	254	206	208	227
0.000855		253	227	210	232	218	243
0.00171		210	218	185	197	219	196
0.00341		166	166	160	186	117	179
0.00683		155	174	174	158	156	141
0.0137		133	136	130	136	163	164
0.0273		143	75	104	167	147	136
0.0546		113	28.2	74.4	133	102	166
0.109		92.6	119	102	67.5	135	78

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000133		1	1	1	1	1	1
0.0000267		1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	1	1	1	1	1
0.0273		1	1	1	1	1	1
0.0546		1	1	1	1	0.6	0.4
0.109		1	0.6	0.8	0.4	0.2	0.4

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	12.2	12.3	11.1	10.7	11	10.1
0.0000133		11.2	11.4	10.8	9.57	12.1	10.1
0.0000267		13	11	8.97	10.3	9.45	12.1
0.0000532		7.98	10.4	10.8	12.6	10.3	10.2
0.000106		10.5	11.2	12.1	12.1	11.7	10.4
0.000213		13	12.9	10.3	10.8	10	10.4
0.000427		12.6	12.7	11.5	9.18	9.02	10.2
0.000855		11.7	10.6	10.2	12.3	10.1	11.2
0.00171		10.5	11.7	8.73	8.63	9.89	11.1
0.00341		6.3	6.64	8.17	6.18	5.2	8.56
0.00683		5.68	6.85	6.35	5.8	5.71	4.98
0.0137		4.99	4.24	5.58	1.96	5.6	5.7
0.0273		5.31	2.63	2.65	4.29	4.11	4.93
0.0546		3.22	0.58	1.92	0.909	1.64	1.07
0.109		0.508	0.417	0.821	0.334	1.02	0.451

CETIS Summary Report

Report Date: 21 Oct-14 12:03 (p 1 of 2)
 Test Code: 49368801 ryegra | 09-1586-5346

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 20-4221-6912	Test Type: Vegetative Vigor Tier II	Analyst:
Start Date: 10 Jan-14	Protocol: OCSPP 850.4150 Plant Vegetative Vigor	Diluent:
Ending Date: 24 Jun-14 12:42	Species: Lolium perenne	Brine:
Duration: 165d 13h	Source: L.A. Hearne Company	Age:
Sample ID: 21-3990-6194	Code: 49368801 ryegra	Client: EPA OCSPP EFED
Sample Date: 10 Jan-14	Material: Aminopyralid	Project:
Receive Date: 24 Jun-14 12:42	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-7915-3813	Height	0.109	>0.109	NA	10.5%		Dunnett Multiple Comparison Test
19-0461-0818	Height	0.109	>0.109	NA	8.03%		Williams Multiple Comparison Test
11-1359-9678	Survival	0.109	>0.109	NA	NA		Jonckheere-Terpstra Step-Down Test
20-0078-0004	Survival	0.109	>0.109	NA	NA		Mann-Whitney U Two-Sample Test
04-9937-1290	Weight	0.109	>0.109	NA	21.0%		Dunnett Multiple Comparison Test
16-0132-2999	Weight	0.109	>0.109	NA	16.0%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
19-8264-8743	Weight	IC5	2.22	N/A	N/A	Nonlinear Regression
		IC10	2.64	N/A	N/A	
		IC25	3.53	N/A	N/A	
		IC50	4.87	N/A	N/A	

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	356	334	377	327	382	8.32	20.4	5.73%	0.0%
0.00341		6	369	349	389	342	389	7.75	19	5.15%	-3.73%
0.00683		6	387	337	436	358	479	19.2	47.1	12.2%	-8.8%
0.0137		6	380	356	404	344	406	9.34	22.9	6.02%	-6.91%
0.0273		6	359	342	377	334	380	6.76	16.6	4.61%	-1.04%
0.0546		6	375	344	406	321	404	12.1	29.7	7.91%	-5.41%
0.109		6	358	334	382	331	395	9.27	22.7	6.34%	-0.68%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0273		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0546		6	1	1	1	1	1	0	0	0.0%	0.0%
0.109		6	1	1	1	1	1	0	0	0.0%	0.0%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	2.58	2.35	2.8	2.26	2.84	0.0883	0.216	8.39%	0.0%
0.00341		6	2.9	2.34	3.45	2.22	3.76	0.216	0.528	18.2%	-12.3%
0.00683		6	2.96	2.56	3.37	2.45	3.43	0.158	0.388	13.1%	-15.0%
0.0137		6	2.89	2.57	3.21	2.52	3.37	0.125	0.306	10.6%	-12.1%
0.0273		6	2.5	2.06	2.93	2.1	3.06	0.169	0.413	16.5%	3.13%
0.0546		6	2.67	2.15	3.19	1.98	3.41	0.203	0.498	18.6%	-3.62%
0.109		6	2.44	2.11	2.77	2.18	2.95	0.127	0.312	12.8%	5.33%

CETIS Summary Report

Report Date: 21 Oct-14 12:03 (p 2 of 2)
Test Code: 49368801 ryegra | 09-1586-5346

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	382	346	327	346	376	357
0.00341		342	386	389	350	374	373
0.00683		358	479	361	394	364	365
0.0137		400	373	406	390	368	344
0.0273		380	372	348	334	361	361
0.0546		321	381	404	379	397	367
0.109		357	343	395	350	331	371

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	1	1	1	1	1
0.0273		1	1	1	1	1	1
0.0546		1	1	1	1	1	1
0.109		1	1	1	1	1	1

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	2.84	2.6	2.26	2.51	2.8	2.46
0.00341		2.78	2.52	3.07	3.02	2.22	3.76
0.00683		3.43	3.31	2.45	3.16	2.7	2.74
0.0137		3.37	3	2.6	2.96	2.52	2.89
0.0273		2.67	3.06	2.1	2.22	2.83	2.1
0.0546		1.98	3.41	2.96	2.8	2.44	2.44
0.109		2.95	2.24	2.18	2.71	2.29	2.28

CETIS Summary Report

Report Date: 21 Oct-14 12:06 (p 1 of 3)
 Test Code: 49368801 sobyea | 10-1632-4052

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 08-7484-3262	Test Type: Vegetative Vigor Tier II	Analyst:
Start Date: 10 Jan-14	Protocol: OCSPP 850.4150 Plant Vegetative Vigor	Diluent:
Ending Date: 24 Jun-14 12:32	Species: Glycine max	Brine:
Duration: 165d 13h	Source: Missouri Foundation Seeds, MO	Age:
Sample ID: 00-7783-3608	Code: 49368801 soybea	Client: EPA OCSPP EFED
Sample Date: 10 Jan-14	Material: Aminopyralid	Project:
Receive Date: 24 Jun-14 12:32	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-5580-6796	Height	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
15-4211-5762	Height	0.000427	0.000855	0.0006042	10.6%		Mann-Whitney U Two-Sample Test
15-9146-7343	Survival	0.0137	0.0273	0.01934	NA		Jonckheere-Terpstra Step-Down Test
04-9023-6069	Survival	0.0137	0.0273	0.01934	7.72%		Mann-Whitney U Two-Sample Test
10-7678-2817	Weight	0.000855	0.00171	0.001209	11.2%		Dunnett Multiple Comparison Test
04-9568-4732	Weight	0.000855	0.00171	0.001209	8.03%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
10-6599-0950	Height	IC5	0.0000502	N/A	0.000141	Nonlinear Regression
		IC10	0.000115	4.54E-05	0.000211	
		IC25	0.000464	0.000309	0.000669	
		IC50	0.00218	0.0017	0.00279	
11-5242-0533	Survival	EC50	0.0249	0.0218	0.0284	Spearman-Kärber
17-0680-4397	Weight	IC5	0.000232	4.99E-05	0.000379	Nonlinear Regression
		IC10	0.000388	0.000244	0.000537	
		IC25	0.000916	0.000709	0.00115	
		IC50	0.00238	0.00202	0.0028	

CETIS Summary Report

Report Date: 21 Oct-14 12:06 (p 2 of 3)
 Test Code: 49368801 sobyea | 10-1632-4052

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	498	446	551	421	555	20.5	50.1	10.1%	0.0%
0.000532		6	484	413	555	410	571	27.6	67.6	14.0%	2.81%
0.000106		6	509	452	566	454	562	22.2	54.5	10.7%	-2.09%
0.000213		6	516	453	578	428	612	24.2	59.2	11.5%	-3.44%
0.000427		6	514	414	614	386	632	39	95.5	18.6%	-3.19%
0.000855		6	398	336	460	316	474	24.1	59.1	14.8%	20.1%
0.00171		6	261	224	298	225	319	14.3	35.1	13.5%	47.7%
0.00341		6	151	137	165	138	177	5.59	13.7	9.06%	69.7%
0.00683		6	126	117	135	115	138	3.5	8.56	6.8%	74.7%
0.0137		6	124	119	128	118	129	1.75	4.28	3.46%	75.2%
0.0273		6	117	101	133	98	143	6.34	15.5	13.3%	76.5%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.0137		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0273		6	0.4	0.135	0.665	0.2	0.8	0.103	0.253	63.2%	60.0%
0.0546		6	0	0	0	0	0	0	0	100.0%	100.0%
0.109		6	0	0	0	0	0	0	0	100.0%	100.0%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	13.7	12.4	15	11.5	14.8	0.512	1.26	9.15%	0.0%
0.000532		6	13.3	12	14.6	11.4	14.4	0.508	1.24	9.36%	3.09%
0.000106		6	14.5	13.4	15.6	13.1	15.7	0.423	1.04	7.14%	-5.81%
0.000213		6	14.3	12.4	16.1	10.9	15.5	0.717	1.76	12.3%	-4.09%
0.000427		6	14.1	13.1	15.2	13.1	15.4	0.404	0.989	7.0%	-2.97%
0.000855		6	13.3	12.3	14.2	11.7	14.2	0.37	0.907	6.82%	3.11%
0.00171		6	8.92	7.82	10	8.05	10.4	0.427	1.05	11.7%	35.0%
0.00341		6	4.09	3.04	5.13	3.14	5.75	0.406	0.996	24.4%	70.2%
0.00683		6	2.66	1.97	3.35	1.58	3.3	0.267	0.655	24.6%	80.6%
0.0137		6	1.76	1.29	2.23	1.05	2.22	0.182	0.446	25.4%	87.2%
0.0273		6	1.07	0.317	1.82	0.3	2.36	0.293	0.717	67.0%	92.2%

CETIS Summary Report

Report Date: 21 Oct-14 12:06 (p 3 of 3)
 Test Code: 49368801 sobyea | 10-1632-4052

OCSP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	527	535	468	421	483	555
0.0000532		548	508	571	410	421	448
0.000106		562	557	556	454	459	465
0.000213		496	612	524	521	512	428
0.000427		632	623	493	386	471	481
0.000855		419	419	423	339	474	316
0.00171		319	225	232	254	253	283
0.00341		177	147	152	138	145	147
0.00683		132	115	128	138	123	119
0.0137		129	119	125	118	125	127
0.0273		98	106	113	122	143	120
0.0546							
0.109							

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	0.8	1	1	1	1
0.0137		1	1	1	1	1	1
0.0273		0.2	0.8	0.6	0.2	0.2	0.4
0.0546		0	0	0	0	0	0
0.109		0	0	0	0	0	0

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	11.5	14.6	14.8	14.2	14.3	13
0.0000532		14.3	12.3	14.4	11.4	14.2	13.2
0.000106		15.6	14.2	15.7	13.8	14.8	13.1
0.000213		10.9	14.9	15.5	15.5	14.9	14.1
0.000427		15.4	13.8	15.3	13.1	13.6	13.5
0.000855		11.7	13.4	14.1	13.1	14.2	13.2
0.00171		9.96	8.88	10.4	8.11	8.09	8.05
0.00341		5.75	3.14	3.39	3.73	4.81	3.7
0.00683		1.58	2.19	2.79	3.3	2.97	3.14
0.0137		2.22	1.49	1.73	1.84	2.22	1.05
0.0273		0.3	0.692	0.753	1.3	2.36	1
0.0546							
0.109							

CETIS Summary Report

Report Date: 22 Oct-14 16:57 (p 1 of 3)
 Test Code: 49368801 sugarb | 12-2735-3692

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 15-2447-4226 Test Type: Vegetative Vigor Tier II Analyst:
 Start Date: 10 Jan-14 Protocol: OCSPP 850.4150 Plant Vegetative Vigor Diluent:
 Ending Date: 24 Jun-14 12:34 Species: Beta vulgaris Brine:
 Duration: 165d 13h Source: Beta Seed Co. Age:

Sample ID: 20-8466-2707 Code: 49368801 sugarb Client: EPA OCSPP EFED
 Sample Date: 10 Jan-14 Material: Aminopyralid Project:
 Receive Date: 24 Jun-14 12:34 Source: Dow AgroSciences
 Sample Age: NA Station:

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-9261-1303	Height	0.00683	0.0137	0.009673	NA		Jonckheere-Terpstra Step-Down Test
05-5776-7062	Height	0.00341	0.00683	0.004826	9.25%		Dunnett Multiple Comparison Test
13-9274-7076	Survival	0.00341	0.00683	0.004826	NA		Jonckheere-Terpstra Step-Down Test
12-4326-7113	Survival	0.0546	0.109	0.07715	10.3%		Mann-Whitney U Two-Sample Test
19-6778-4193	Weight	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
21-0424-6113	Weight	0.000855	0.00171	0.001209	9.59%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
20-2699-0782	Height	IC5	0.00196	0.00102	0.00309	Nonlinear Regression
		IC10	0.00486	0.00319	0.00688	
		IC25	0.0222	0.0181	0.027	
		IC50	0.12	0.0944	0.152	
16-8590-8478	Survival	EC5	0.0108	0.00345	0.0203	Linear Regression (MLE)
		EC10	0.0262	0.0128	0.0521	
		EC25	0.115	0.0569	0.51	
		EC50	0.599	0.198	9.61	
20-8390-7424	Weight	IC5	0.000512	N/A	0.000823	Nonlinear Regression
		IC10	0.000799	0.00047	0.00112	
		IC25	0.00168	0.00126	0.00216	
		IC50	0.00385	0.0032	0.00464	

CETIS Summary Report

Report Date: 22 Oct-14 16:57 (p 2 of 3)
 Test Code: 49368801 sugarb | 12-2735-3692

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	165	152	178	148	184	5.14	12.6	7.62%	0.0%
0.000532		6	176	170	181	170	185	2.21	5.42	3.09%	-6.42%
0.000106		6	177	160	194	159	197	6.66	16.3	9.23%	-7.11%
0.000213		6	172	164	179	163	180	2.87	7.03	4.1%	-4.02%
0.000427		6	178	175	181	174	182	1.2	2.95	1.66%	-7.8%
0.000855		6	176	165	188	162	190	4.49	11	6.24%	-6.73%
0.00171		6	178	167	188	168	190	3.98	9.76	5.49%	-7.68%
0.00341		6	180	169	192	168	194	4.42	10.8	6.01%	-9.19%
0.00683		6	144	128	160	128	168	6.28	15.4	10.7%	12.6%
0.0137		6	141	135	148	136	152	2.42	5.92	4.19%	14.3%
0.0273		6	119	110	129	108	130	3.62	8.86	7.43%	27.7%
0.0546		6	107	101	114	99.4	117	2.55	6.24	5.81%	34.9%
0.109		6	97	84.1	110	82	116	5.01	12.3	12.6%	41.2%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	0.867	0.612	1	0.4	1	0.0989	0.242	27.9%	13.3%
0.0137		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.0273		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	10.0%
0.0546		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.109		6	0.667	0.45	0.883	0.4	1	0.0843	0.207	31.0%	33.3%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	6.27	5.5	7.04	5.51	7.12	0.3	0.734	11.7%	0.0%
0.000532		6	6.52	6	7.04	6.04	7.45	0.202	0.494	7.58%	-4.06%
0.000106		6	6.46	5.83	7.08	5.73	7.47	0.243	0.596	9.23%	-3.02%
0.000213		6	6.69	6.14	7.23	6.15	7.56	0.212	0.52	7.78%	-6.72%
0.000427		6	6.43	6.22	6.64	6.11	6.7	0.0816	0.2	3.11%	-2.59%
0.000855		6	6.24	5.89	6.58	5.92	6.67	0.134	0.328	5.26%	0.45%
0.00171		6	5.35	4.72	5.99	4.72	6.47	0.247	0.606	11.3%	14.6%
0.00341		6	4.56	3.87	5.24	3.4	5.15	0.266	0.651	14.3%	27.3%
0.00683		6	1.41	-0.00533	2.83	0.344	3.58	0.552	1.35	95.6%	77.4%
0.0137		6	0.712	0.383	1.04	0.336	1.12	0.128	0.314	44.1%	88.6%
0.0273		6	0.248	0.184	0.312	0.166	0.339	0.0249	0.061	24.5%	96.0%
0.0546		6	0.167	0.106	0.228	0.0546	0.206	0.0237	0.0581	34.9%	97.3%
0.109		6	0.16	0.12	0.2	0.134	0.234	0.0156	0.0382	23.9%	97.4%

CETIS Summary Report

Report Date: 22 Oct-14 16:57 (p 3 of 3)
 Test Code: 49368801 sugarb | 12-2735-3692

OCSP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	175	159	148	163	161	184
0.0000532		177	173	176	172	170	185
0.000106		197	161	193	159	169	181
0.000213		168	176	180	178	163	166
0.000427		177	179	176	174	179	182
0.000855		190	172	187	169	162	176
0.00171		186	190	171	169	168	183
0.00341		178	194	168	171	178	193
0.00683		157	128	142	139	131	168
0.0137		139	136	139	139	152	144
0.0273		111	122	108	130	128	117
0.0546		105	109	99.4	112	103	117
0.109		116	93	87.8	106	82	97.7

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	0.4	1	1	0.8	1
0.0137		1	1	1	1	0.8	1
0.0273		1	1	1	0.8	0.8	0.8
0.0546		1	1	1	1	1	0.8
0.109		1	0.6	0.8	0.4	0.6	0.6

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	6.92	7.12	5.51	5.52	5.81	6.72
0.0000532		6.47	6.42	6.04	6.55	6.2	7.45
0.000106		6.76	6.36	7.47	5.73	6.23	6.19
0.000213		6.84	6.88	6.46	7.56	6.24	6.15
0.000427		6.55	6.34	6.11	6.43	6.7	6.44
0.000855		6.67	6.37	6.53	5.92	6	5.94
0.00171		5.38	6.47	5.09	5.04	4.72	5.42
0.00341		5.06	5.15	3.4	4.42	4.38	4.92
0.00683		0.623	0.763	0.538	3.58	0.344	2.64
0.0137		0.622	0.829	0.336	1.12	0.962	0.401
0.0273		0.232	0.293	0.339	0.166	0.212	0.249
0.0546		0.199	0.178	0.206	0.0546	0.156	0.206
0.109		0.234	0.149	0.137	0.168	0.138	0.134

CETIS Summary Report

Report Date: 22 Oct-14 17:00 (p 1 of 3)
 Test Code: 49368801 turnip | 13-5341-4223

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Batch ID: 02-5130-6816	Test Type: Vegetative Vigor Tier II	Analyst:
Start Date: 10 Jan-14	Protocol: OCSPP 850.4150 Plant Vegetative Vigor	Diluent:
Ending Date: 24 Jun-14 12:36	Species: Brassica rapa	Brine:
Duration: 165d 13h	Source: NE Seed	Age:
Sample ID: 20-1248-7046	Code: 49368801 turnip	Client: EPA OCSPP EFED
Sample Date: 10 Jan-14	Material: Aminopyralid	Project:
Receive Date: 24 Jun-14 12:36	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-4600-5170	Height	0.000427	0.000855	0.0006042	NA		Jonckheere-Terpstra Step-Down Test
17-2254-3067	Height	0.000427	0.000855	0.0006042	21.2%		Dunnett Multiple Comparison Test
11-7607-0116	Survival	0.00683	0.0137	0.009673	NA		Jonckheere-Terpstra Step-Down Test
03-3563-8264	Survival	0.0273	0.0546	0.03861	11.1%		Mann-Whitney U Two-Sample Test
05-8358-5140	Weight	0.000855	0.00171	0.001209	NA		Jonckheere-Terpstra Step-Down Test
05-9305-9031	Weight	0.000855	0.00171	0.001209	38.5%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	95% LCL	95% UCL	TU	Method
01-5561-3009	Height	IC5	0.0000497	1.43E-05	0.000112	Nonlinear Regression
		IC10	0.000205	0.000114	0.000335	
		IC25	0.00219	0.00159	0.00295	
		IC50	0.0303	0.0232	0.0396	
01-8885-9468	Survival	EC5	0.0211	0.0144	0.0266	Linear Regression (MLE)
		EC10	0.0253	0.0184	0.031	
		EC25	0.0343	0.0274	0.0405	
		EC50	0.0481	0.0409	0.0568	
01-3316-1493	Survival	EC50	0.0494	0.0424	0.0576	Trimmed Spearman-Kärber
11-5291-4358	Weight	IC5	0.000671	0.000138	0.00109	Nonlinear Regression
		IC10	0.00112	0.000631	0.00162	
		IC25	0.00264	0.00191	0.00349	
		IC50	0.00683	0.00562	0.00829	

CETIS Summary Report

Report Date: 22 Oct-14 17:00 (p 2 of 3)
 Test Code: 49368801 turnip | 13-5341-4223

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	237	212	262	192	254	9.75	23.9	10.1%	0.0%
0.0000133		6	239	219	260	210	267	8	19.6	8.19%	-1.01%
0.0000267		6	236	222	250	215	254	5.34	13.1	5.54%	0.28%
0.0000532		6	226	208	245	200	247	7.16	17.5	7.76%	4.55%
0.000106		6	250	228	271	221	279	8.43	20.6	8.27%	-5.43%
0.000213		6	238	228	248	225	250	3.8	9.31	3.91%	-0.52%
0.000427		6	224	200	247	185	250	9.1	22.3	9.96%	5.49%
0.000855		6	195	177	213	174	222	7.17	17.6	9.01%	17.7%
0.00171		6	183	172	194	174	197	4.14	10.1	5.54%	22.8%
0.00341		6	161	146	177	137	174	6	14.7	9.11%	31.8%
0.00683		6	160	142	179	127	176	7.32	17.9	11.2%	32.3%
0.0137		6	146	124	167	122	173	8.43	20.7	14.2%	38.5%
0.0273		6	122	105	139	90.2	134	6.61	16.2	13.2%	48.4%
0.0546		5	113	90.4	136	97	145	8.29	18.5	16.3%	52.1%
0.109		1	108			108	108	0	0	0.0%	54.4%

Survival Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000133		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000267		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0000532		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000106		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000213		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000427		6	1	1	1	1	1	0	0	0.0%	0.0%
0.000855		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00171		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00341		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00683		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0137		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.0273		6	0.933	0.762	1	0.6	1	0.0667	0.163	17.5%	6.67%
0.0546		6	0.4	0.0245	0.775	0	1	0.146	0.358	89.4%	60.0%
0.109		6	0.0333	0	0.119	0	0.2	0.0333	0.0816	245.0%	96.7%

Weight Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	14.3	13.3	15.2	13.2	15.3	0.365	0.894	6.27%	0.0%
0.0000133		6	15.1	13.7	16.5	13.5	16.9	0.55	1.35	8.91%	-6.05%
0.0000267		6	14.9	13.2	16.6	13.1	17.3	0.659	1.62	10.9%	-4.43%
0.0000532		6	14.6	11.9	17.4	10.9	17.9	1.07	2.61	17.9%	-2.69%
0.000106		6	15.9	13.8	18	13.5	19	0.816	2	12.6%	-11.4%
0.000213		6	15.8	14.2	17.4	12.8	17	0.619	1.52	9.62%	-10.6%
0.000427		6	14.1	11.7	16.5	11.2	17.4	0.94	2.3	16.3%	0.99%
0.000855		6	12.4	10	14.8	8.21	14.4	0.936	2.29	18.4%	12.8%
0.00171		6	11.1	8.7	13.4	6.64	12.5	0.923	2.26	20.4%	22.3%
0.00341		6	8.69	6.27	11.1	4.33	10.5	0.944	2.31	26.6%	39.0%
0.00683		6	9.55	8.77	10.3	8.09	10.1	0.306	0.749	7.84%	33.0%
0.0137		6	4.88	1.52	8.24	1.23	8.77	1.31	3.2	65.6%	65.7%
0.0273		6	2.36	0.971	3.74	0.9	4.03	0.538	1.32	56.0%	83.5%
0.0546		5	0.604	0.428	0.78	0.468	0.804	0.0634	0.142	23.5%	95.8%
0.109		1	0.304			0.304	0.304	0	0	0.0%	97.9%

CETIS Summary Report

Report Date: 22 Oct-14 17:00 (p 3 of 3)
 Test Code: 49368801 turnip | 13-5341-4223

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor)

ABC Labs

Height Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	253	254	239	231	252	192
0.0000133		230	267	250	245	234	210
0.0000267		254	234	238	215	232	244
0.0000532		243	247	225	200	217	224
0.000106		245	279	260	259	234	221
0.000213		236	236	234	225	248	250
0.000427		240	185	219	228	221	250
0.000855		205	174	183	185	202	222
0.00171		187	190	174	174	175	197
0.00341		151	174	171	137	164	172
0.00683		163	127	174	176	167	155
0.0137		173	128	168	122	143	139
0.0273		130	124	90.2	130	134	124
0.0546		105	145	97	113		107
0.109							108

Survival Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0000133		1	1	1	1	1	1
0.0000267		1	1	1	1	1	1
0.0000532		1	1	1	1	1	1
0.000106		1	1	1	1	1	1
0.000213		1	1	1	1	1	1
0.000427		1	1	1	1	1	1
0.000855		1	1	1	1	1	1
0.00171		1	1	1	1	1	1
0.00341		1	1	1	1	1	1
0.00683		1	1	1	1	1	1
0.0137		1	1	1	0.8	1	1
0.0273		1	0.6	1	1	1	1
0.0546		1	0.2	0.2	0.4	0	0.6
0.109		0	0	0	0	0	0.2

Weight Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	13.6	15.3	14.9	13.6	14.9	13.2
0.0000133		14.8	13.5	16.4	16.9	13.9	15.2
0.0000267		14.5	13.6	17.3	16.3	13.1	14.5
0.0000532		13.6	17.1	17.9	10.9	13.2	15.1
0.000106		16.7	14.8	16.9	19	14.4	13.5
0.000213		16	16	17	16.9	12.8	15.9
0.000427		16	11.2	13.1	17.4	12.6	14.3
0.000855		13.7	8.21	14.4	11.7	13.9	12.6
0.00171		12.5	12.4	6.64	10.9	12.4	11.6
0.00341		8.59	9.98	10.5	4.33	8.44	10.3
0.00683		10	10.1	9.92	8.09	9.57	9.61
0.0137		8.03	1.23	4.71	1.32	5.24	8.77
0.0273		3.7	1.02	0.9	2.49	4.03	1.99
0.0546		0.478	0.681	0.468	0.804		0.588
0.109							0.304